October Specifications Committee Meeting Agenda

Meeting Date

Wednesday, October 2, 2019 @ 9:00am
Building 5, Room 855

Approved Permanent Specification changes from last Committee meeting (8/7/19)

- **Section 623-Pneumatically Applied Mortar or Concrete (Shotcrete)** Complete section re-write.
- **109.10-Price Adjustment of Asphalt Binder** Updates PG-64S sources & item numbers in Table 109.10.1

Approved Project Specific Special Provisions (SP) from last Committee meeting (8/7/19)

- **SP601-Embedded Galvanic Anode Protection**
- **SP601-Epoxy Bonding Compound**
- **SP601-Epoxy Resin Injection**
- **SP663-Parking Stripe**

Items removed from Committee Agenda

- **SP492-Cold Central Plant Recycling**
- **SP601-Structural Concrete Type K Cement**
- **SP701.5-Expansive Concrete**

Old Business - Provisions discussed at last Committee meeting

490	**SP490-Nine Year Pavement Performance Criteria**	**This is an update to previously approved SP. 4th time to committee; discussed in April, June, & August** Project Specific Special Provision for long term warranty. The update would all use of the Division's in-place automated pavement condition data collection in evaluating warranty paving projects. The SP has been updated. A redline copy, showing the proposed changes from the last meeting is included. Approval is expected in October
403	**SP403 Hot-Applied Asphalt Mastic Treatment**	**4th time to committee; discussed in April, June, & August** Project Specific Special Provision for hot-applied asphalt mastic treatment. This is a maintenance item that is used to fill large cracks in asphalt pavement that are normally too big for standard crack seal, yet smaller then what would justify patching. The SP has been updated. A redline copy, showing the proposed changes from the last meeting is included. Approval is expected in October

601	**SP601 - Electrochemical Chloride Extraction**	**4th time to committee; discussed in April, June, & August** Project Specific provision for Electrochemcial Chloride Extraction (ECE). The SP has been updated. A redline copy, showing the proposed changes from the last meeting is included. Approval is expected in October
103	**103.6.1-Contactor's General Liability Insurance**	**3rd time to Committee; discussed in June & August** Proposed specification change to Section 103.6. It add 'Damages to Rented Premises' item and removed 'Fire Damage' item so that the spec book and Accord-25 match. No update to the provision. A redline copy, showing the proposed changes/updates to specification is included. Approval is expected in October
108	**108.3.2-Detailed Construction Schedule**	**3rd time to Committee; discussed in June & August** Proposed specification change to Section 108.3. The update is to correct formatting of the subsection. There are no changes to the language in the provision. A copy of the proposed specification is included. Approval is expected in October
218	**SP218-Filter Layer**	**3rd time to Committee; discussed in June & August** Project Specific Special Provision (SP) for filter layer using material referenced in 704.7 or Class 10 aggregate for rock lined ditches and channels. Provision has been updated, per comments at the last meeting. Approval is expected in October
607	**607.8-Pay Items**	**3rd time to Committee; discussed in June & August** Proposed specification change to Section 607. It removes Bullnose Attenuator pay item from the specifications & modifies Round Wood Post pay item for repair or replacement only. Provision has been updated, per comments at the last meeting. Approval is expected in October
636	**SP636-Temporary CCTV**	**3rd time to Committee; discussed in June & August** Project Specific Special Provision (SP) for temporary cctv. The device is for use in work zone to monitor traffic flow thru the project. No update to the provision. Approval is expected in October

107	**SP107-MS4 Requirements**	**This is an update to previously approved SP. 2nd time to Committee; discussed in August.** Project Specific Special Provision (SP) change to MS4 requirements in urbanized areas. The revision is to stay in compliance with the permit conditions. No updated to the SP. A redline copy, showing the proposed changes/updates to SP is included. Approval is expected in October
406	**SP406-High Friction Surface Treatment**	**This is an update to previously approved SP. 2nd time to Committee; discussed in August.** Project Specific Special Provision posed specification change to high friction surface treatment. It updates subsection 406.6.3.1-skid testing requirements. SP has been updated per comments at the last meeting. A redline copy, showing the proposed changes/updates to SP is included. Approval is expected in October
103	**103.5-Requirement of Contract Bond**	**2nd time to Committee; discussed in August.** Proposed specification change to Section 103.5. It updates the contract bond requirements. No update to the spec change. A redline copy, showing the proposed changes/updates to specification is included.
109	**109.6-Partial Payments**	**2nd time to Committee; discussed in August.** Proposed specification change to Section 109. It updates the retainage held by the Division. The specification has been updated per comments at the last meeting. A redline copy, showing the proposed changes/updates to specification is included.
501	**SP501-Concrete Truck Apron**	**2nd time to Committee; discussed in August.** Project Specific Special Provision (SP) for truck apron with color concrete and stamped pattern. SP has been updated per comments at the last meeting. A redline copy, showing the proposed changes/updates to SP is included.
601	**601.3.2.1-Consistency**	**2nd time to Committee; discussed in August.** Proposed specification change to Section 601. It fixes an incorrect metric measurement in footnote of Table 601.3.2. No update to the specification. A redline copy, showing the proposed changes/updates to specification is included. Approval is expected in October

601	**SP601 - Concrete Block**	**2nd time to Committee; discussed in August.** Project Specific Special Provision (SP) for concrete block. The blocks are to be used in non-structural applications like stream bank stabilization and temporary causeways. The SP has been updated. A redline copy, showing the proposed changes from the last meeting is included. Approval is expected in October
607	**SP607-Bridge Deck Mounted Guardrail**	**2nd time to Committee; discussed in August.** Project Specific Special Provision (SP) for bridge deck mounted guardrail system. The SP has been updated. A redline copy, showing the proposed changes from the last meeting is included. Approval is expected in October
614	**614.5-Concrete or Grout**	**2nd time to Committee; discussed in August.** Proposed specification change to Section 614. The update waives A-bar testing of concrete. No update to the spec change. A redline copy, showing the proposed changes/updates to specification is included. Approval is expected in October
628	**SP628-Rock Anchors**	**2nd time to Committee; discussed in August.** Project Specific Special Provision (SP) for Rock anchors. The SP has been updated. A redline copy, showing the proposed changes from the last meeting is included.
639	**639.5-Basis of Payment**	**2nd time to Committee; discussed in August.** Proposed specification change to Section 639. The update pays the lump sum on a monthly basis equal to months remaining. The specification has been updated per comments at the last meeting.
679	**679.3.1.1-Removal of Existing Deck Surface Phase I**	**2nd time to Committee; discussed in August.** Proposed specification change to Section 679. The update is to clarify the removal is to the top of rebar in top mat. The specification has been updated per comments at the last meeting. A redline copy, showing the proposed changes/updates to specification is included.
900	**SP900-Tempoary Railroad Crossing**	**2nd time to Committee; discussed in August.** Project Specific Special Provision (SP) for temporary railroad crossing. No update to the SP.

New Business - New Provisions for Spec Committee

SECTION	TITLE	DESCRIPTION
NA	**Subcontractor Prompt Payment**	**This is an update to previously approved SP. 1st time to Committee.** Project Specific Special Provision (SP) for Subcontractor Prompt Payment. The revision is so that it is in line with the proposed 103.5 and 109.6 specification changes.
102	**102.7-Irregular Proposals**	**1st time to Committee.** Proposed specification change to Section 102. The update add mathematically and materially unbalanced bid requirements. A redline copy showing the proposed changes/updates to the specification is included.
207	**SP207-Remove, Store, and Place Material**	**1st time to Committee.** Project Specific Special Provision (SP) for removal of existing streambed material, temporary storing, and placing it in the enhanced stream channel.
405	**405.14.2-Acceptanc Testing**	**1st time to Committee.** Proposed specification change to Section 405 - Chip Seals. The revision adds an extra sampling option.
420	**420.2-Materials**	**1st time to Committee.** Proposed specification change to Mico Surfacing section. The update adds sentence that the material must be from approved source.
501	**501.3-Propertioning**	**1st time to Committee.** Proposed specification change to Section 501. It switches the requirement for a volumetric replacement of SCMs to replacement by mass. It also lowers the maximum allowable w/c to 0.44.
501	**501.5.3.4-Nonagitator Trucks**	**1st time to Committee.** Proposed specification change to Section 501. The change will allow aluminum truck beds.
501	**501.12.7-Final Finish**	**1st time to Committee.** Proposed specification change to Section 501. The change is for longitudinal tining. This has been used as Special Provision on several concrete pavement projects.
601	**601.3-Mix Design Requirements**	**1st time to Committee.** Proposed specification change to Section 601. It switches the requirement for a volumetric replacement of SCMs to replacement by mass.
615	**615.6.9-Final Cleaning of Weathering Steel Bridges**	**1st time to Committee.** Proposed specification change to Section 615. It allows cleaning to be performed with NACE equivalent.
615	**SP615-Pack Rust Repair**	**1st time to Committee.** Project Specific Special Provision (SP) for repair of steel members that have been deformed by pack rust.

625	**SP625-CSL Testing**	**1st time to Committee.** Project Specific Special Provision (SP) for CSL testing of caisson by the Division.
636	**636.9-Traffic Control Devices**	**1st time to Committee.** Proposed specification change to Subsection 636.9. The update reflects the APL's language
636	**636.25-Pay Items**	**1st time to Committee.** Proposed specification change to pay item of Section 636. It is to clarify Temporary Traffic Signal supplemental description.
687	**687.2.1.2-Blasting**	**1st time to Committee.** Proposed specification change to Section 687. It allows cleaning to be performed with NACE equivalent.
688	**688.2.2.2-Blasting, 688.3.4-Painting Sequence, and 688.5.6-Paint Sequence**	**1st time to Committee.** Proposed specification change to Section 688. It allows cleaning to be performed with NACE equivalent.
704	**704.7-Filter Material**	**1st time to Committee.** Proposed specification change to Subsection 704.7. It corrects a couple metric sieve sizes.
709	**709.56-U-Channel Supports and Breakaway Splice Devices**	**1st time to Committee.** Proposed specification change to Section 709. It adds material requirements for U-Channel sign supports and addresses MASH crash testing requirements.
715	**715.9.5-Portable Sign Stands**	**1st time to Committee.** Proposed specification change to Section 715. It add material requirements for portable sign supportsThe update reflects the APL's language
900	**SP900 - Railroad** **SP107.8-Railroad-Highway Provisions** **SP212.3-Materials** **SP639.3-Construction Layout Stakes.**	**1st time to Committee.** Four Project Specific Special Provision (SP) for Railroad. 1. SP900 to remove existing track, signal equipment removal, furnish and Insall new rail and ties, compromise welds, crossing with asphalt underlayment, standard two-way flashers with gate, and control cabinet 2. SP107.8 states the Railroad Chief Engineer 3. SP212.3 is related to the railroad industry construction equipment requirements 4. SP639.3 is for baseline survey of existing railroad
506	**Section 506 – Concrete Pavement Repair**	**1st time to Committee (added 9/30/19).** Proposed specification change to Section 506. It is a complete section rewrite and updates the full and partial depth concrete repairs procedure. A redline copy showing the proposed changes/updates to the specification is included.

Comments

Comments are requested on these Specification Changes and Project Specific Special Provisions. Please share your comments by September 30, 2019, they help in the decision making process.

Please Send Comments to: DOHSpecifications@wv.gov

Deadline for new items & updates to these provisions is November 7, 2019

If you are the 'champion' of any specification changes and/or project specific special provisions currently in the Specification Committee, it is your responsibility to edit/update/modify them in a timely manner per comments and discussion in Spec Committee. *Failure to submit updates may result in removal of item and/or delays.*

Next Meeting

Wednesday, December 4, 2019 at 9am
Building 5, Room 855: *(If Available. If not available a change in venue will be attached on the door)*

2017 Standard Specifications Roads and Bridges & 2019 Supplemental Specifications

Electronic Copy (pdf): The 2017 Standard Specifications Roads and Bridges & 2019 Supplemental Specifications can be viewed, printed, or downloaded from the Specifications Website. A link to the Specifications pages is here: http://transportation.wv.gov/highways/contractadmin/specifications

Print Version: Hard copies of the 2017 Standard Specifications Roads and Bridges & 2019 Supplemental Specifications are available thru Contract Administration. An order form for the book is on Specifications Website. A link to the pages is here: http://transportation.wv.gov/highways/contractadmin/specifications

2019 Specifications Committee

The Specification Committee typically meet every other month; on the first Wednesday. 2019 meetings will be held in February, April, June, August, October, and December.
Calendar subject to change, updates will be given, as needed.

Specifications Committee Website

A copy of the meeting agenda can be found on the Specifications Committee Website
http://transportation.wv.gov/highways/contractadmin/specifications/SpecComit

Material Procedures

Material Procedures (MPs) referenced in provisions are available upon request.

For questions regarding the Standard Specifications Roads and Bridges, Supplemental Specifications, Project Specific Special Provisions, or the Specifications Committee please e-mail DOHSpecifications@wv.gov

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File Format Structure and Progression of items thru Specifications Committee

The purpose of the below protocol is to provide guidance on the file structure of Proposed Specification & Project Specific Special Provision as they progress thru Specification Committee. This procedure would facilitate a means of tracking changes from meeting to meeting; as the agendas & provisions are posted publicly online on the Spec Committee website.

TYPES OF PROVISIONS:

There are three standard types of provisions typically discussed in committee:

1. Specification Changes – These are permanent changes to the WVDOT Standard Specifications.
    - Unless inserted into a project proposal, these changes typically go into effect in January (of subsequent year) with the Supplemental Specifications.
2. Project Specific Special Provisions (SP) – Are applied to specifically designated projects.
3. Updates to previously approved SP – Changes/edits/updated to SP that have been approved by spec committee.

NEW BUSINESS ITEMS:

New items to should be setup & submitted in the following format:

1. Specification Changes – Shown as red-line copy (see note)
2. Project Specific Special Provisions (SP) – Will be shown in all black.
3. Updates to approved SP – Shown as red-line copy

Each item should also include a description with:

- Brief overview of item
- Background info and/or reason for change

NOTE: Red-line copy is a form of editing in which indicate removal or addition of text. You can redline a Microsoft Word document by using the built in "Track Changes" feature or you can manually redline document with font color changes & strike-through.

OLD BUSINESS ITEMS:

Updated provisions that were discussed at the last committee meeting should be setup in the following format:

- Redline copy from prior meeting would not be shown
- Redline copy of new changes/updates (from previous meeting)

PROGRESSION OF ITEMS THRU COMMITTEE AND APPROVAL:

Depending on how important the project and/or comments/discussion of item at previous meeting, then several things can happen in no particular order

- Few comments/discussion/minor changes … will recommend approval of item at next meeting
- A lot of comments/discussion … will not recommend approval at next meeting; item will be updated and reviewed again at next meeting.
- SP's in committee may be used in advertised project. Hope to work to address comments & finish approving at subsequent meeting.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 490
NINE YEAR PAVEMENT PERFORMANCE CRITERIA

490.1-DESCRIPTION:

The pavement performance period shall consist of satisfying the performance criteria requirements of the work contained in the appendices. This special provision establishes the common terms and definitions. The pavement performance criteria assure and protect the Division from specific defects found in the pavement.

490.1.1-Definitions:

Acceptance Date of Initial Construction Work-The date when the work is completed and is continuously open to traffic. This shall be the date of initial acceptance and constitutes the start date for the performance criteria period. For divided highways, there may be more than one acceptance date of work for a project.

Performance Lane(s)-The portion of the pavement considered performance criteria work. Each of the following shall be considered a separate performance lane.

1. Each individual mainline lane and adjacent shoulder
2. The sum of all ramp lanes and the associated acceleration/deceleration lanes
3. The sum of all auxiliary lanes, such as passing lanes and turn lanes

Approaches and driveways are not considered.

Performance Criteria Work - Work that is guaranteed to meet the performance requirements as defined and calculated in Appendix A, throughout the performance rating period.

Maintenance Work - Corrective action taken by the Contractor to bring the performance criteria work into compliance with the performance requirements and calculations detailed in Appendix A.

490.2-INITIAL ACCEPTANCE:

The Division and the Contractor shall jointly review all completed work, or a portion thereof, as determined by the Division. If the Division determines that the work is in compliance with the contract specifications and is continuously open to traffic, then the date of initial acceptance occurs. If the work does not meet contract requirements, the Contractor shall make all necessary corrections, at its expense, prior to initial acceptance. The date on which initial acceptance occurs shall be termed the Initial Acceptance Date of Initial Construction Work and is to be documented in accordance with this special provision.

As stated in Section 490.1.1, once the Initial Acceptance date has been determined this shall act as the start date for the performance criteria period.

The Division may accept any portion of the work and begin the performance period to accommodate seasonal limitations or staged construction, excluding any area needing corrective work.

490.3-BLANK:

490.4-RIGHTS AND RESPONSIBILITIES OF THE DIVISION:

The Division:

1. Reserves the right to approve the time, traffic control and methods for performing any work.
2. Reserves the right to approve the schedule proposed by the Contractor to perform work.
3. Reserves the right to determine if work performed by the Contractor meets the contract specifications.
4. Reserves the right to perform, or have performed, routine core maintenance activities during the performance period, which this routine core maintenance will not diminish the Contractor's responsibility under the performance criteria. Core Maintenance activities consist of: Mowing, Snow Removal, Striping, Guardrail Repair, Signing, and Maintaining Ditches and other Drainage Structures.
5. Reserves the right, if the Contractor is unable, to make immediate emergency repairs to the pavement to prevent an unsafe road condition as determined by the Division. The Division will attempt to notify the Contractor that action shall be required to address an unsafe condition. The Division will record the time and date of the attempts for Contractor notification. However, should the Contractor be unable to comply with this requirement, to the Division's satisfaction and within the required time frame specified by the Division, the Division will perform, or have performed any emergency repairs deemed necessary. Any such emergency repairs undertaken will not relieve the Contractor from meeting the performance requirements of this Special Provision. Any costs associated with such emergency repairs due to defective work will be paid by the Contractor.
6. Shall be responsible for monitoring the pavement throughout the performance period and will provide the Contractor any written reports of the surface condition or maintenance activities, or both related to pavement performance.
7. Shall be responsible for notifying the Contractor, in writing, of any corrective action required to meet the pavement performance requirements.

490.5-RIGHTS AND RESPONSIBILITIES OF THE CONTRACTOR:

The Contractor:

1. Shall ensure that the work will be free of defects as measured by the performance parameters and specified threshold values as defined in Appendix A.
2. Shall be responsible for performing all work including, but not limited to, maintaining traffic and restoring all associated pavement features, at the Contractor's expense.
3. Shall be responsible for performing all work in accordance with any contract details, established WVDOH policies, or Industrywide Best Management Practices, or combination thereof. Use of repair materials different than the constructed pavement structure may be permitted on a temporary basis and no such temporary repairs shall remain in place at the end of the current rating period. Any deviations from such policies shall be approved by the Engineer and may require a signature and seal of a currently Licensed West Virginia Professional Engineer.
4. Shall be responsible for performing all temporary or emergency repairs, resulting from being in non-compliance with the pavement performance requirements, using Division approved materials.
5. Shall notify the Division and submit a written course of action for performing the needed work, ten calendar days prior to commencement of said work, except in the case of emergency repairs as detailed in this special provision. The submittal must propose a schedule for performing the work and the materials and methods to be used.
6. Shall follow a Division approved temporary traffic control plan when performing work.
7. Shall pay lane rental fees as stipulated in the Contract, during maintenance work.
8. Shall complete all work required by this special provision and prior to conclusion of the pavement performance period, or as otherwise agreed to by the Division.

490.6-EVALUATION METHOD:

The Division will conduct pavement evaluations in accordance with Appendix A using the Division's Pavement Condition Collection Contract or field pavement condition reviews, including roughness measurements, or both. This evaluation may be waived in emergency situations.

Results of the Division's pavement evaluation will be handed over to the Contractor within thirty (30) days of August 31. These results will detail any bonus or penalties along with locations for various distress areas that require corrective action.

490.7-PAVEMENT PERFORMANCE REQUIREMENTS:

Maintenance work will be required as per the requirements and calculations of Appendix -A.

490.8-BLANK

490.9-EMERGENCY REPAIRS:

If the Division determines that emergency repairs are necessary for public safety, the Division or its agent may take repair action.

Prior to emergency repairs, the Division will document the basis for the emergency action, will preserve evidence of the defective condition, and document all materials and methods used for the repair.

490.10-NON-EXTENSION OF CONTRACT:

This Special Provision shall not be construed as extending or otherwise affecting the claim process and statute of limitation applicable to this Contract.

SECTION 490: APPENDIX A

PAVEMENT PERFORMANCE
NINE YEAR PERFORMANCE CRITERIA AND EVALUATION

Preliminary Project Evaluation - In order to help facilitate design of a system that meets the criteria set forth in this contract, the Division may perform the following and make available the results to prospective bidders.

1. Perform Non-Destructive Testing (NDT) to help delineate pavement layer thickness and to help delineate transitions within the overall pavement structure in the pavement performance section.
2. Perform field coring of pavement at selected locations based on pavement condition, or at locations where abrupt changes in NDT results may indicate a transition in pavement section, or both.

Performance Requirements – Pavement Performance Requirements are set for three different categories: Ride Quality (Section A1), Threshold Limits (Section A2), and Pavement Surface Distress Index (PSDI) (Section A3).

The finished road surface shall be evaluated annually during the performance period no later than August 31 of each year; this date shall not be extended for any reason. The Contractor can ask the Division to perform the rating prior to August 31. Contractor's personnel will be allowed review the evaluation process.

If desired, the contractor may monitor and survey the pavement in addition to the work being performed by this agency. However, any destructive work such as coring or milling shall not be performed without approval by the Engineer and at no additional cost to the Division.

Corrections for deficient shoulder conditions based on Threshold Limits (Section A2) are included in performance criteria Work, however no PSDI ratings or IRI ratings shall be performed on shoulders and no bonuses or penalties shall be received or collected due to shoulder conditions. The Contractor shall be notified of shoulder areas needing corrective action after each Roadway Evaluation, or in case of emergencies.

A1 RIDE QUALITY

Shoulder work shall be exempt from ride quality measures. Yearly IRI values shall be in accordance with Standard Specifications Section 720, Smoothness Testing, for the entire length of the project limits. The yearly IRI values shall be determined by the Division no later than August 31 of each year; this date shall not be extended for any reason. The Contractor can ask the Division to perform the rating prior to August 31.

The overall IRI shall meet or exceed the following in Table A5 at the specified age:

TABLE A1 IRI CRITERIA				
Year	IRI Criteria for Bonus	Bonus	IRI Criteria for Penalty	Penalty
One	<65	0.11%	>81	0.22%
Two	<65	0.11%	>81	0.22%
Three	<65	0.28%	>81	0.56%
Four	<65	0.28%	>81	0.56%
Five	<65	0.44%	>81	0.88%
Six	<65	0.44%	>81	0.88%
Seven	<65	0.89%	>81	1.78%
Eight	<65	0.89%	>81	1.78%
Nine	<65	1.56%	>81	3.12%

As noted above, the subject contract allows for payment bonuses and penalties for IRI. Bonus and Penalty Payments are not cumulative and do not carry over from year to year.

A2 THRESHOLD LIMITS AND CORRECTIVE ACTION

Each index in the following sections A2.1 and A2.2 has a threshold level applied to each segment before corrective action (maintenance work) shall be required. Following the annual data collection, this work shall be completed prior to June 10 of the next calendar year.

Each lane mile will be divided into 10 equal 0.1 mile segments starting at the beginning milepost. Threshold limits apply to the entire performance section, and have been established to allow a certain extent of low severity distresses within 0.1 mile segments before corrective action is required.

Polished Aggregate will be described for informational purposes to support overall characterization of the road surface. Skid testing will be used to quantify acceptable levels of surface friction. Skid Testing will be conducted yearly and completed by the Division or an independent testing firm. Skid testing will be performed with the ribbed tire as prescribed in AASHTO T242, *Frictional Properties of Paved Surfaces Using a Full-Scale Tire.* Any skid number less than 35 shall require corrective action of the failed test section as defined in AASHTO T242. Any corrective action required by DOH for skid numbers 35 or greater shall be paid for in accordance with section 109.4.

When corrective action is taken to address thresholds within a pavement segment, all distresses associated with that threshold must be addressed in that 0.1 mi segment and the adjacent lane. If a segment that is adjacent to a partial segment (roadway less than 0.1 mile) is subject to corrective action, that adjacent partial segment shall also receive the same corrective action in both lanes. Similarly, should a partial segment be subject to corrective action, the adjacent full segment shall receive the same corrective action in both lanes. All corrected sections will be monitored for performance. If distresses are repaired and integrity of repair is maintained, it shall not be counted against threshold limits.

Any permanent repairs shall be of equal or better quality material than the original section. The Contractor is advised that any permanent repairs consisting of different material properties than was originally placed shall be done over the entire rating segment. This restriction does

not apply to temporary fixes, such as those placed for emergency purposes or placed to slow deterioration during winter.

Shoulders have no threshold limits for low severity distresses; however, medium and high severity distresses shall require corrective action.

A2.1 ASPHALT PAVEMENT

Index	Limit
Structural Cracking Index (SCI)	4
Environmental Cracking Index (ECI)	4
Rut Depth Index (RDI)	4

A2.2 PCC PAVEMENT

Index	Limit
Joint Condition Index (JCI)	4
Slab Condition Index (SCI)	4

A3 PAVEMENT SURFACE DISTRESS INDEX

The Pavement Surface Distress Index (PSDI) will represent the West Virginia Division of Highways (WVDOH) crack and surface distress index for this contract. It uses a 0.0 to 100.0 rating scale: the higher the number, the less overall distress shall be present. Generally, a perfect or newly constructed road has a PSDI of 100.0. As the type, amount and severity of the various defects increase, the PSDI drops.

The overall PSDI shall meet or exceed the following in Table A3 at the specified age:

TABLE A3 PSDI CRITERIA

Year	PSDI Criteria for Bonus	Bonus	PSDI Criteria for Disincentive	Penalty
One	98	0.11%	96	0.22%
Two	98	0.11%	96	0.22%
Three	97	0.28%	95	0.56%
Four	96	0.28%	94	0.56%
Five	94	0.44%	92	0.88%
Six	92	0.44%	90	0.88%
Seven	91	0.89%	89	1.78%
Eight	89	0.89%	87	1.78%
Nine	87	1.56%	85	3.12%

Please note that the subject contract allows for payment bonuses for PSDI. Bonus and Penalty Payments are not cumulative and do not carry over from year to year.

CALCULATING THE PAVEMENT SURFACE DISTRESS INDEX (PSDI)

PSDI is a composite number based on multiple pavement data indices, depending on the surface type. Pavement data indices will be from the WV DOH Pavement Management System, which follows the Roadway Data Collection Specifications.

For asphalt pavements, PSDI is based on the following:

1. Structural Cracking Index (SCI), a function of Alligator and Longitudinal Cracking
2. Environmental Cracking Index (ECI), a function of Transverse and Block Cracking
3. Rut Depth Index (RDI), a function of Rut Depth

Calculation the PSDI on asphalt pavements is as follows:

$$\frac{(\mathrm{SCI} + \mathrm{ECI} + \mathrm{RDI})}{15} * 100$$

For concrete pavements, PSDI is based on the following:

1. Slab Condition Index (SCI), a function of Faulting and Joint Distress
2. Joint Condition Index (JCI), a function of Transverse and Longitudinal Slab Cracking

Calculation the PSDI on asphalt pavements is as follows:

$$\frac{(\mathrm{SCI} + \mathrm{JCI})}{10} * 100$$

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 403
HOT-APPLIED ASPHALT MASTIC (HAM) TREATMENT

403.1–DESCRIPTION:

This work shall consist of cleaning and filling voids in asphalt pavement that are too large for standard crack sealing, yet smaller than those that require typical patching procedures. This process uses a hot applied, pourable, aggregate filled asphalt mastic material.

403.2–MATERIALS:

Hot-Applied Asphalt Mastic (HAM) shall be composed of quality selected asphalt, select aggregates with structural integrity, synthetic rubber polymers, antioxidants, naturally occurring and man-made reinforcing material, and other modifiers. This product must be delivered from the manufacturer pre-packaged and not mixed in the field.

If not on the Division's Approved Source List, the materials shall conform to the following requirements:

MATERIAL	PROPERTY	TEST	REQUIREMENT
Aggregate	Abrasion Resistance	ASTM C131	35% max
	Gradation	AASHTO T27	100% pass 5/8"
Binder	Penetration @77°F	ASTM D5329	60 max
	Penetration @122°F	ASTM D5329	120 max
	Softening Point	ASTM D36	200°F min
	Flexibility @32°F	ASTM D3111[1]	Pass
Blend	Flexibility @32°F	ASTM D5329[2]	No cracking or loss of aggregate adhesion

Note 1: 1 inch mandrel, 180 degree bend, 10 seconds.
Note 2: Specimen size 10" long, 1" wide, and ¾" deep.

403.3–CONSTRUCTION:

403.3.1–General: Prior to placement, submit to the Engineer written certification from the manufacturer for each shipment, which shall include a statement of the HAM material quantity and QC data for each production run. A production run shall be described as the quantity of material produced during one cycle from startup to shutdown of the manufacturer's equipment.

Construction methods and QC plan, which shall include the manufacturer's installation guidance, shall be submitted to the Engineer for review at least 7 calendar days prior to the start of work. This review may require modification of the proposed methods to provide the desired end result. The manufacturer's recommended installation procedures shall be followed unless otherwise specified in this Special Provision. The manufacturer must supply on-site technical assistance for at least the first day and must remain until the engineer determines the assistance is no longer required.

403.3.2–Weather Restrictions: Perform surface preparation and repair when the ambient and pavement surface temperatures are least 45°F and rising. Should the HAM be placed and rain falls before the HAM has properly cured, and it is determined that the HAM has been damaged, remove and replace the contaminated HAM at no additional cost to the state.

403.3.3–Surface Preparation: Prior to application of the HAM, ~~A~~all repair areas shall be dry and free of all dirt, dust, grease, and loose material according to manufacturer's recommendation. ~~prior to application of the HAM~~. When recommended by the manufacturer, a surface conditioner or primer approved by the manufacturer shall be applied to the repair area prior to placement of the HAM.

403.3.4–Equipment: All equipment, tools, and machinery shall be provided by the contractor and maintained in a satisfactory working condition. The contractor shall use a machine that can simultaneously agitate and indirectly heat the material to the manufacturer's recommendations, while continuously agitating and indirectly heating during application. Immediately discard any material if it is heated beyond the manufacturer's recommended safe heating temperature, is allowed to cool, or is unused for more than 10 hours.

403.3.5–Installation: The HAM shall be agitated and heated in a manufacturer's recommended melter, to the manufacturer's recommended application temperature. The hot HAM shall be poured directly onto the repair area, made flush with the existing pavement, and leveled for a smooth surface. If two lifts are required, the first lift shall be sufficiently cooled before the second lift is applied. Any HAM that pulls loose within 96 hours after opening to traffic shall be replaced at no additional cost. The contractor shall cooperate with the Engineer to keep accurate running totals of the pounds of HAM used. This shall be reported daily.

403.4–MEASUREMENT AND PAYMENT:

HAM will be measured and paid for at the Contract unit price per pound. The manufacturer's weights of the HAM will be accepted as the basis for measurement. Payment will be full compensation for furnishing, hauling, and placing of all materials, the removal and disposal of old filler and debris, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment will not be made for wasted material.

403.5–PAY ITEMS:

ITEM	DESCRIPTION	UNIT
403002-001	Hot-Applied Asphalt Mastic	Pound

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 601
STRUCTURAL CONCRETE

601.1-DESCRIPTION:

ADD THE FOLLOWING SUBSECTION:

601.1.1-Electrochemical Chloride Extraction: This work consists of the extraction of chloride ions from contaminated reinforced concrete bridge elements, as noted in the plans, using an Electrochemical Chloride Extraction (ECE) treatment. The ECE treatment is performed by applying an electrical field between the reinforcement and an anode mesh placed in a reservoir on the surface of the concrete.

601.2-MATERIALS:

ADD THE FOLLOWING TO THE END OF THE SECTION:

Materials for Concrete Repair shall be only Portland cement concrete, or mortars having an appropriate electrical resistivity for repairs.

Anode System:

1. Use steel anode mesh during the treatment. Remove any rust staining produced by the steel anode during the ECE treatment.
2. Provide anode system with an anode mesh embedded in a reservoir on the concrete surface.
3. Provide electrolyte reservoir consisting of cellulose fiber saturated with an electrolyte.
4. Use cellulose fiber specifically designed and tested for use with Electrochemical Chloride Extraction. Provide cellulose fiber having the following physical properties:
   a. Consist of 100% natural cellulose fibers
   b. Be treated with fire retardant
   c. Contain a minimum of 8% calcium hydroxide as a pH buffer and chlori~~n~~de scavenger

d. Be self-adherent
e. Have water absorption of 500% to 1500% of dry fiber weight.
f. Prior to spraying of the cellulose fiber onto the concrete surface to be treated, affix wooden battens of appropriate size or suitable spacers to the concrete.
g. Electrolyte - provide electrolyte consisting of potable water. Calcium Hydroxide may be added if deemed necessary by ECE Contractor. The electrolyte will be delivered via ½ gallon/hour maximum drippers spaced every 1.5 feet.
h. Electrical Insulating Material - Waterproof electrical insulating materials to be used to cover all electrical connections.

Power Supply:

1. Provide an appropriate AC power supply.
2. DC Power Supply
   a. Provide DC power rectifiers supplied by the ECE Contractor with sufficient number of independent AC/DC converter circuits for the number of individual concrete zones to be treated.
   b. Provide AC/DC converters rated to provide total output current and voltage to meet the current demand of the individual abutment, wing wall, or pier column zone. Provide a current distribution box for each zone, so that each zone can be divided into subzones that can operate electrically in parallel. The voltage on the secondary side is to be limited to approximately 40 VDC. Converters shall be rated and capable of operating continuously at maximum output under site conditions of temperature and relative humidity.
   c. Enclosures - House converters in vandal-proof enclosures suitable for site conditions.
   d. Controls and connections – Provide each AC/DC converter output unit with:
      i. All output controls.
      ii. One output voltmeter and one output am~~p~~meter.
      iii. Provision for direct measurement of output voltage of the secondary side with an external meter.
      iv. Easy access to the positive and negative terminals of each output, clearly marked "+VE Anode" and "- VE Rebars". Fully insulate output terminals from the chassis or its enclosure.
      v. An adequately rated circuit breaker, enclosed in a mo~~u~~lded case designed for operation at ambient temperature, on the main input to ensure protection against short circuit and thermal overload.
      vi. Main cable connections conforming to all applicable standards and regulations.
   e. Electrical components:
      i. Encapsulate all electronic component subassemblies in epoxy resin or varnishes, as recommended by the component manufacturers.
      ii. Provide rectifiers suitable for continuous operation at the specified output ratings, with a peak inverse voltage of at least 800 volts. These rectifiers are to have double windings, which must be separated by a grounded metallic screen or mounted on separate limbs of a grounded core.
      iii. Provide rectifiers of the silicon type with suitable AC surge protection. Use fuses to protect the rectifiers on the DC output side.

iv. AC ripple on DC output of all rectifiers not to exceed 2V at all output settings from 10 to 100% of rated voltage and current outputs.

3. Cables-Provide stranded copper conductors, insulated with cross-linked polyethylene listed by UL for all cables and wiring.
   a. DC cables:
      i. Identify cables for connection to the anode mesh (positive) by red insulation and of a minimum gauge 10 AWG.
      ii. Identify cables for connection to the reinforcing steel (negative) by black insulation and of a minimum gauge of 6 AWG.
      iii. Label each DC cable according to the zone or portion of a concrete structure that it is connected to.
      iv. Digital Voltmeter – Provide a battery-operated digital voltmeter (DVM) to enable test and monitoring during the treatment period. Ensure that spare batteries are available for continuous testing. At a minimum, provide the DVM with 3.5 digit display and resolution of 10 mV and an error of no more than 1 digit. Input impedance of the DVM to be at least 10 MegaOhms.
      v. Current Probes – Provide a battery-operated current tong probe, with spare batteries for continuous testing, for current readings during the treatment period. The error of the probe to be no more than +5%.

601.3-PROPORTIONING:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

601.3-ECE CONTRACTOR QUALIFICATIONS:

601.3.1-ECE Contractor Qualifications: A qualified speciality ECE contractor shall perform and monitor the ECE treatment.

The ECE contractor shall have successfully completed at least five previous ECE installation projects on concrete structures in the US within the last 10 years. Documentation verifying the description, location, agency, agency contact representative, and contact details shall be submitted at the preconstruction conference. A project is defined as a structure or series of structures which were completed as part of a single contract.

601.3.2-ECE Installation Personnel Qualifications: All personnel engaged in the ECE work shall have satisfactorily completed an education and training program in the installation methods, monitoring, and removal procedures for ECE. Training certification shall be submitted at the preconstruction conference.

601.3.3-ECE Project Management and Quality Control Personnel Qualifications: The ECE Contractor shall provide a Cathodic Protection (CP) Specialist accredited by the National Association of Corrosion Engineers (NACE) with a minimum of 10 years of ECE work experience. The NACE CP Specialist, or a NACE CP Technician under his direction, shall supervise the overall installation of the ECE system including the design of construction sequence and oversee every phase of the work.

The CP Specialist or the CP Technician under his direction shall be responsible for preparing and implementing a quality control plan for the project, which shall be submitted to the engineer for approval.

The CP Specialist and the CP Technician each shall have a minimum of 5 years ECE system installation work experience in a supervisory/quality control position.

Qualifications of the Project Management/Quality Control personnel shall be submitted at the preconstruction conference.

601.4-TESTING:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

601.4.1-Sampling and Testing Methods:

601.4.1.1-Chloride Analysis: Sampling of concrete for chloride analysis is performed by drilling either cores or obtaining powder samples. Cores shall be cut into slices and crushed to fine powder.

Analyses to determine the residual water-soluble chloride content in the concrete shall be in accordance to AASHTO T260-97. Field measurements may be made using the rapid chloride test method.

601.4.1.2 Sampling Procedure: Sampling of the concrete before and after treatment should be carried out by experienced personnel. Care shall be taken to prevent cross contamination between samples. As chlorides in unreinforced concrete do not cause any deterioration of the concrete, the main purpose of the process is to treat the concrete in the vicinity of the rebar. It is therefore important that the concrete in the vicinity of the rebar is the area which is tested (particularly post treatment samples).

The procedure for collecting samples shall be as follows:

a. The exact location of the rebars, in the area to be tested, shall be located with a cover meter, pachometer, or other suitable rebar-locating device. Core samples shall be taken directly over a single rebar while dust samples may be drilled adjacent to the intersection of two rebars. The samples shall be extracted by taking cores no greater than 3″ in diameter down to the depth of the rebar and if permitted by the engineer, through the rebar. Alternatively, dust samples may be extracted with the use of a hammer drill. The drill bit should be the smaller of $1.5d_b$ of the rebar in the location being tested, or 1″. To eliminate surface variability, the concrete shall be drilled to a depth of ¼″ (6mm) and the dust discarded. Dust samples shall be taken in standard increments from the surface to the depth of the rebar. To avoid cross contamination the drill bit shall be cleaned or may be changed to one of a smaller diameter for the different increments. The hole shall be thoroughly cleaned with compressed air at each increment. Samples shall immediately be placed into sealed airtight bags, or other suitable containers. They should then be clearly marked with the contract name, the date, the location of the sample, the depth from which the sample was removed, and the depth of the rebar at that location.

601.5-EQUIPMENT AND TOOLS:

DELETE THE CONTENTS AND REPLACE THE FOLLOWING:

601.5.1-Core and Rotary Impact Drills: Drills for obtaining concrete cores and powder samples before and after treatment to be made available by the ECE Contractor. Typical diameter of the cores to be drilled is 2 to 3 inches.

601.6-HANDLING, MEASURING, AND BATCHING OF MATERIALS:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

601.6-CONSTRUCTION:

Apply the ECE treatment to all concrete surfaces as detailed in the plans. Prior to performing ECE, all concrete repair work shall be complete and sufficiently cured (minimum 7 days) before proceeding with the treatment.

601.6.1 Working Drawings: The Contractor shall submit plans and notes that include the location of all equipment on the project site, proposed sampling and testing procedures, core and dust sample locations, anticipated treatment duration, power feeds to the structure being treated, material catalog cuts, application and removal procedures with anticipated lane closure durations, equipment required, and contact information.

601.6.2 Sampling, Testing, and Coordination: A minimum of 10 working days before beginning substructure repairs, conduct a coordination meeting with the Engineer, ECE subconsultant contractor, and the manufacturers of the epoxy injection materials and surface crack sealant materials to ensure that the substructure repairs will not adversely affect the performance of the ECE.

Only portland cement concrete, or mortars having an appropriate electrical resistivity shall be used in repairs. Use only hydraulic cement concrete for spall repairs.

Obtain a minimum of five (5) samples from ~~the~~ each substructure for chloride analysis.

Sample concrete for chloride analysis by drilling either cores or powder samples. Cut cores into slices and crush to fine powder.

Determine the residual water soluble chloride content in the concrete as specified in AASHTO T260-97. Measurements may be made using the rapid chloride test method.

Sample the concrete before and after treatment. Prevent cross contamination between samples. Take core samples directly over a single reinforcing bar while dust samples may be drilled adjacent to the intersection of two reinforcing bars.

Submit a report to the Engineer which includes documenting the findings from the preliminary investigation and recommendations for the ECE installation.

601.7-MIXING:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

601.7-INSTALLATION PROCEDURE:

601.7.1 Preparation of the Concrete for Treatment:

601.7.1.1 Pre-Installation Survey: Visual and sounding surveys shall be carried out over the full surface area of the structure to determine where delamination and where previous repairs have been carried out. In addition, areas where concrete cover over the rebars is insufficient (i.e., less than 0.5 inch) shall be located, by means of a cover meter/pachometer survey or selective chip-outs.

601.7.1.2 Removal and Replacement of Delaminated Concrete: Delaminated and spalled concrete areas shall be repaired in accordance with contract documents, before the ECE treatment.

601.7.1.3 Remediation for Insufficient Concrete Cover: A layer of cement-based grout shall be applied over all areas determined to have insufficient concrete cover until the total cover at each area is at least 0.5 inch.

601.7.1.4 Insulation of Visible or Shallow Metal Components: Any tie wires, nails, or other metal components~~,~~ that are close to the surface or visible on the surface of the concrete~~,~~ shall be removed or insulated with silicone rubber or non-conductive epoxy. If necessary, these may be cut back to not less than 0.5 inch below the surface, then patched with a cement-based grout.

601.7.1.5 Reinforcement Continuity: Ensure that the top-layer rebars in the structure are electrically continuous prior to treatment. This can be done either at existing spall locations, or at cathode (rebar) connection points. If necessary additional holes can be drilled or chipped. If the voltage difference between any two rebars (from different locations in the structure) is no more than 1.0 mV (when measured with a high input impedance voltmeter with a resolution of no less than 0.1 mV), or resistance is less than 5 Ohms (when measured with an Ohm / multimeter), these rebars are considered to be continuous.

Drawings of the structure showing reinforcement details shall be inspected to locate areas where continuity might not exist, and direct measurements of voltage differences or resistance between rebars in these areas and other areas in the structure shall be made. In addition, measurement points shall include locations along the perimeter and the middle of each structural component. Records of the locations of measurement points and the measured voltage/resistance differences shall be submitted to the Engineer with the final report, or sooner if requested.

Where any electrical discontinuity is identified, proposals for providing continuity shall be submitted to the Engineer for approval before proceeding.

601.7.1.6-Reinforcement (Negative) Connections: There shall be at least 1 rebar connection per 500 sq. ft. of concrete surface area, and never less than 2 connections per zone. Rebar connections shall be made by drilling a ¾ inch diameter hole down to the rebar, ensuring that the rebar surface is cleaned by the action of the drill, and then inserting a lead plug connected to the cathode wire into the hole, and using a setting tool to compress the lead plug to hold the cathode wire against the rebar. Immediately after a connection

has been made, the connection shall be coated with a non-conductive material, such as silicone rubber, or the hole may be sealed with an approved patch repair mortar.

601.7.1.7-Connection of Metal Fixtures: Any metal fixtures attached to the concrete structure must be protected against corrosion by electrical connection to the reinforcement. Exposed steel shall also be masked and protected from contact to the anode mesh. Any cable used in providing electrical connections shall comply with the requirements of Section 601.2 and the sheathing shall be color coded black.

601.7.2-Installation of the Anode System:

601.7.2.1-Preparation of the Concrete Surface: The surface of the concrete shall be cleaned of any grease, coating, etc., that may interfere with the passage of electrical current, to ensure optimum treatment efficiency. Sandblasting or water jetting may be required to achieve this.

To prevent short circuits, any exposed steel, in or on the surface of the concrete, shall be adequately masked and, if necessary, connected to the reinforcement or removed, before applying the anode system.

601.7.2.2-Electrolytic Reservoir: The reservoir shall consist of an anode mesh embedded within electrolyte-saturated cellulose ~~fibre~~fiber.

The ~~fibre~~fiber and the electrolyte shall be delivered through separate hoses, then mixed at a nozzle and sprayed directly onto the surface of the concrete. The anode mesh shall be securely fixed using wooden battens or suitable plastic spacers. (Plastic screws and plugs must be used with wooden battens). The distance between the wooden battens shall be no more than 3 ft.

The cellulose ~~fibre~~fiber shall contain a minimum of 8% calcium hydroxide or a minimum of 8% calcium hydroxide shall be added to the cellulose ~~fibre~~fiber during mixing and spraying.

The ~~fibre~~fiber-electrolyte mixture shall be applied only after the anode mesh is securely installed. The total ~~fibre~~fiber-electrolyte layer shall be approximately 1.5 to 2 inch thick and must submerge the anode mesh.

After the anode and reservoir have been installed, the entire area shall be wrapped with plastic and secured to reduce dehydration. Throughout the ECE treatment, the reservoir shall be wetted with electrolyte and kept saturated. Provide the necessary water supply and containers.

601.7.3-Connection of Cables: All DC cables shall be placed and connected so that they do not cause any unnecessary inconvenience. Cable insulation shall be checked; any damaged insulation shall be repaired using a generous amount of an appropriate insulation material, or by making new joints, which shall be contained in junction boxes.

All AC power cables shall be installed in accordance to relevant NEC codes and standards.

601.7.4-Placement of the AC/DC Converters: The Engineer shall approve the location for placement of the converters. The chassis of the converters shall be grounded in accordance with relevant NEC codes and standards.

601.7.5-Inspection of the Installation: The installed anode system, its electrical connections, and power cables shall be fully inspected by the ECE Contractor's technician to the satisfaction of the Engineer prior to the initiation of the ECE treatment. AC power will be connected by a certified electrician as per relevant codes.

601.8-FORMS:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

601.8-SYSTEM OPERATION AND MAINTENANCE:

601.8.1-System Start-Up:

601.8.1.1-Circuit Verification: Prior to start-up or energization of power, tests shall be undertaken to ensure that all measurements and power distribution circuits are correctly wired, connected and labelled. Where appropriate, the circuits shall have the expected resistances.

Using a suitable voltmeter, the negative polarity of the reinforcement shall be confirmed when the power sources are switched on.

601.8.1.2-Adjustment of Current Output: Initial energizing of the system shall be undertaken only upon completion of the procedures described in clause 601.8.1.1.

The current used for the chloride removal treatment shall generally be between 0.1 A/sq. ft. to 0.2 A/sq. ft. and shall not exceed 0.5 A/sq. ft.

During the treatment, the current output shall be measured individually in each anode cable (as detailed in section 601.8.2). The total current can be adjusted by decreasing or increasing the applied voltage. If the results indicate an unexpected current distribution, an inspection shall be carried out to determine the reason, and remedial action shall be taken and documented.

601.8.2-Monitoring of System Operation:

601.8.2.1-Inspections: During the treatment, the operation of the system shall be checked regularly by the ECE Contractor and the following records shall be made:

1. Date and time
2. Current (to each zone and subzone)
3. Voltage (to each zone)
4. Amp-hour (calculate for each zone)

If a problem develops the ECE Contractor shall determine the cause, rectify the problem, and report it to the Engineer.

In addition, visual inspection of cable connections, cable insulation, anode meshes, and wetting of the cellulose ~~fibre~~fiber shall be conducted regularly.

Any interruption in the operation shall be recorded and reported to the Engineer.

601.8.2.2-Determination of Chloride Content: In addition to the regular inspection, determination of the residual water-soluble chloride (Cl^-) in the concrete adjacent to the steel (per ASTM C-1218) shall be carried out as deemed necessary during the treatment. The determination shall be conducted on concrete samples to be taken at pre-determined

points at the level of the rebar. These locations shall be submitted to the Engineer for approval prior to commencement of the ECE treatment. Tests are generally completed near the location and at the same depth (reinforcing steel depth) as previous pre-treatment test locations.

If the results of any of these analyses indicate that the system is not operating properly, the ECE Contractor shall determine the cause and rectify the situation.

601.8.3-Remedial Work: During the treatment, remedial work shall be conducted whenever any inspection indicates that the system is not performing properly. Any remedial work shall be performed at no additional cost to the Division. This remedial work shall include, but not necessarily be limited to, the following:

1. Repair or replacement of defective components of the system.
2. Modification to correct any electrical short circuits or to prevent stray currents.

601.9-ADVERSE WEATHER CONDITIONS:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

601.9-TERMINATION OF THE ELECTROCHEMICAL CHLORIDE EXTRACTION (ECE) TREATMENT:

601.9.1-Termination of Treatment: The ECE treatment shall be performed until one of the following criteria is achieved:

1. 60 calendar days treatment duration
2. Until a total of 60A-hrs/sq. ft. of current has been passed
3. Until the chloride in the concrete in the vicinity of the reinforcing steel has decreased to 0.03% by weight of concrete after correction for background or chlorides, whichever is the earliest.

601.9.2-Removal and Disposal of the System: The ECE Contractor shall remove all electrical cables, conduits, hangers, and power supplies from the site. The cellulose fiber, anode mesh, and wooden battens shall also be removed from the site or be disposed in accordance with applicable disposal and safety regulations.

601.9.3-Post Treatment Cleaning and Repairs: The surface of all treated concrete shall be washed with pressure cleaning, using clean water. If a steel anode has been used, then a light abrasive blast shall be undertaken to remove stains left by the corroded mesh.

The entire treated structure shall then be inspected; the occurrence, location, and extent of any physical damage or changes to the concrete shall be noted. Any defects such as holes made on the concrete (to install wooden battens, conduit hangers, system negative connections, etc.) shall then be repaired.

601.9.4-Surface Treatment of the Concrete: After the ECE treatment, all the treated concrete surfaces shall be cleaned, prepared, and sealed/coated as per Contract documents

601.9.5-Documentation: Within 60 calendar days upon completion of the surface treatment, the ECE Contractor shall submit a written final report to the Engineer detailing the installation and all operating data for the system. This shall include records of all tests and measurements~~,~~ made before, during, and after treatment, including those listed in Section 601.8.2.

The final report shall include, and describe in detail, at least the following information:

1. Rebar continuity on the structure and locations of any continuity bondings made
2. Surface preparation performed before treatment
3. Description of the ECE installation and procedure used
4. Materials used with manufacturers' data sheets
5. Description of test locations and test procedures
6. Current and voltage readings during treatment
7. All test results including pre and post Cl^- levels.
8. Locations and repair of any damage to the concrete arising from the treatment
9. Discussion of results, including consideration of any local anomalies or variations in results
10. Statement on effectiveness of the treatment

601.10-PLACING CONCRETE:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

601.10-GALVANIC ANODE INSTALLATION:

Contractor shall install embedded galvanic anodes in accordance with manufacturer's recommendations, at all exposed areas of exposed rebar in the reinforced concrete bridge elements, as noted in the plans, and as listed in this Special Provision.

1. Install galvanic anodes to existing reinforcement along the perimeter of the repair at spacing as specified by the manufacturer. In no case shall the distance between anodes exceed 30 inches nor shall the distance between the anode and the edge of the repair exceed 6 inches.
2. Provide a 1-inch clearance between anodes and substrate to allow repair material to encase anode. If necessary, increase the size of the repair cavity to accommodate the anodes.
3. Secure the galvanic anodes as close as possible to the patch edge using the anode tie wires (bare wire). Wrap tie wires around the cleaned and uncoated reinforcing steel at least one full turn in opposite directions and then tighten the tie wires to allow little or no free movement. If the anode is to be tied onto a single bar, or if less than 1½-inch of concrete cover is expected, place anode beneath the uncoated bar and secure to reinforcing steel. If 1½-inch concrete cover will exist over the anode, the anode may be placed at the intersection between two bars and secured to each bar.

NOTE: Do not use this special provision for patch areas less than 5 ft^2. Anode spacing shall be specified by the designer. Anode spacing is dependent upon the reinforcing steel density; chloride content; and amount of zinc per anode. The density of the reinforcing steel is the total surface area of the bar (ft^2) within a square foot of concrete (regardless of depth). Corrosion levels in the concrete can be broken into three measurable categories based on ASTM C 1152 Acid-Soluble Chloride of Mortar and Concrete: Light corrosion levels: < 4 lb/yd^3, Moderate corrosion levels 4 to 8 lb/yd^3 and High corrosion levels: > 8 lb/yd^3. In lieu of coring to determine chloride thresholds, the following general guidelines may be considered: Light corrosion for concrete aged 0-15 years and exposed to deicing salt or concrete of any age not directly exposed to deicing salt; Moderate corrosion for concrete aged 16-30 years and exposed to deicing salt; High corrosion for concrete 31 years and older and exposed to deicing salt. The following anode spacing guidelines are based a minimum zinc content of 100 grams per anode and to mitigate the initiation of new corrosion activity:

Steel Density Ratio	**Anode Spacing (Inches)**		
	Light Corrosion Levels	**Moderate Corrosion Levels**	**High Corrosion Levels**
< 0.3	30	30	30
0.31 – 0.6	28	26	24
0.61 – 0.9	26	23	20
0.91 – 1.2	22	20	18
1.21 – 1.5	20	18	16
1.51 – 1.8	18	16	14
1.81 – 2.1	17	14	12

Confirm electrical connection between every anode tie wire and uncoated reinforcing steel with a multi-meter. The maximum DC resistance shall be 1 Ohm. Confirm electrical continuity of every exposed uncoated reinforcing steel bar within the repair area. Steel reinforcement shall be considered continuous when the DC resistance is 1 Ohm or less. If necessary, establish the electrical continuity with uncoated steel tie wire.

Provide the Engineer a report documenting the resistance measurement for every reinforcing bar in each repair area. The report shall be signed by the contractor's employee responsible for supervision of the repair work.

601.14-METHOD OF MEASURMENT:

ADD THE FOLLOWING TO THE END OF THE SECTION:

The quantity of Electrochemical Chloride Extraction will be based on the surface area in square feet as determined from the lines and dimensions shown on the plans, subject to field verification.

601.15–BASIS OF PAYMENT:

ADD THE FOLLOWING TO THE END OF THE SECTION:

The quantities, determined as provided above, will be paid for at the contract bid price, which includes all labor, tools, equipment, supplies, tests, and incidentals necessary to complete the work.

601.16-PAY ITEMS

ADD THE FOLLOWING ITEM TO THE TABLE:

ITEM	DESCRIPTION	UNIT
601030-020	Electrochemical Chloride Extraction	Square Foot

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 103
AWARD AND EXECUTION OF CONTRACT

103.6-INSURANCE REQUIREMENTS:

103.6.1-Contractor's General Liability Insurance:

DELETE THE TABLE AND REPLACE WITH THE FOLLOWING:

General Aggregate	$2,000,000
Products/Completed Operations Aggregate	$2,000,000
Personal & Advertising Injury	$1,000,000
Each Occurrence *	$1,000,000
~~Fire Damage~~	~~$50,000~~
Damages to Rented Premises	$300,000
Medical Expense Limit	$5,000

* Each Occurrence limit shall be $2,000,000 when performing any operations that are subject to 107.8 – Railway-Highway Provisions.

~~May 14, 2019~~ August 8, 2019

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

~~SPECIAL PROVISION~~

~~FOR~~

~~STATE PROJECT NUMBER:~~ _____

~~FEDERAL PROJECT NUMBER:~~ _____

FOR

SECTION 108
PROSECUTION AND PROGRESS

108.3-PROSECUTION OF THE WORK:

108.3.2-Detailed Construction Schedule (Schedule):

DELETE THE CONTENTS OF SUBSECTION 108.3.2 AND REPLACE THE FOLLOWING:

The Schedules shall be prepared using scheduling software Primavera Project Manager P6 version 6.0 or higher.

The following criteria shall apply to the development and maintenance of the Schedule:

1. All Resources shall be grouped in a Project Resource Tree. This tree structure shall have one main heading name that begins with the Project's specific 7 digit Contract ID Number followed by an underscore, followed by the Project Name.
2. Individual Resource names shall be shown as a sublevel to the main heading name. The Individual Resource names shall begin with the Project's specific 7 digit Contract ID Number followed by an underscore, followed by the Project Name. Any additional description may follow the underscore.
3. The use of Project Codes is prohibited.
4. The use of Global Activity Codes are prohibited, however, Project Activity Codes may be used. The Project Activity Code names shall begin with the Project's specific seven (7) digit Contract ID Number followed by an underscore. Any additional description may follow the underscore.
5. Global Calendars are prohibited (except as noted below in section 7). However, Project Calendars may be used. The Project Calendar names shall begin with the project's

specific seven (7) digit contract number, followed by an underscore. Any additional description may follow the underscore. In addition, the Project Default Calendar shall be assigned as a Project Calendar.

6. The use of Cost Accounts is not required. However if the Contractor elects to use them, then all Cost Account names shall be grouped in a Project Cost Accounts Tree. This tree structure shall have one main heading name that begins with the project's specific 7 digit Contract ID Number followed by an underscore, followed by the Project Name.

~~a.~~7. Individual cost account names shall be shown as a sublevel to the main heading name. The individual cost account names shall begin with the Project's specific seven (7) digit Contract ID Number, followed by an underscore. Any additional description may follow the underscore.

~~7.~~8. The Contractor Resource Calendar shall be linked to the WVDOT Standard Calendar. The WVDOT Standard Calendar shall be assigned to each resource and shall be allowable as the only calendar for all Schedule Resources. This shall be accomplished by creating a Global Calendar named and formatted exactly as follows:

WVDOT Standard 5 Day Workweek with holidays.

~~a.~~9. The first activity on the Schedule shall be Contract letting which shall be designated as a milestone starting on the actual contract letting date.

~~b.~~10. The second activity on the Schedule shall be Project Award which shall be designated as a milestone with a 30 day lag from the Contract Letting milestone.

~~c.~~11. The third activity on the Schedule shall be Notice to Proceed which shall be designated as a milestone with a 30 day lag from the Project Award milestone (or with a 7 day lag from Project Award on projects with an Incentive/Disincentive clause).

~~d.~~12. Subsequent to the Notice to Proceed milestone, the logic and duration of remaining activities shall be developed and tied to the Substantial Completion milestone described in Section 108.3.1.

~~e.~~13. Schedule calculation will be computed by Retained Logic method.

~~f.~~14. Only contractual Constraints can be used on activities when preparing the Schedule, otherwise the use of Constraints is prohibited.

~~g.~~15. All Actual Start Dates and Actual Finish Dates shall be reasonably captured in updated schedules.

~~h.~~16. The activity costs described in Section 108.3.4 shall be incorporated into the Schedule via Resource Section. The use of Expenses for costs is prohibited

The Schedule shall be submitted on standard D size sheets (24" x 36"). The critical path shall be distinguished from other paths on the Schedule. All back-up data used to generate the Schedule shall be submitted in digital form on acceptable media that is compatible with the computer system.

The submitted Print Out of the Schedule shall include the following data for each activity in the initial submittal and in all updates and revisions:

1. Activity number, as well as preceding and following activity numbers;
2. Activity description;
3. Duration of activity, in working days;
4. All quantities in accordance with pay items;

5. Dollar value of activity;
6. Remaining duration of activity, in working days;
7. Earliest start date, by calendar date;
8. Earliest finish date, by calendar date;
9. Actual start date, by calendar date;
10. Actual finish date, by calendar date;
11. Latest start date, by calendar date;
12. Latest finish date, by calendar date;
13. Total float for activity;
14. Free float for activity;

In addition to the above, the following information and data shall be included with the submission of the digital form to the Division:

15. Number of shifts per work day, hours per shift for activity;
16. Number of work days per week for activity;
17. Major equipment and corresponding hours for activity;
18. Manpower by Trade or entity and corresponding hours for activity;
19. Activity Usage Profile Cost of Contractor's Income.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 218
SLOPE AND FOUNDATION PROTECTION

218.1-DESCRIPTION:

ADD THE FOLLOWING SUBSECTION:

218.1.1-Filter Layer: The filter layer shall conform to the Contract plans or established by the Engineer.

218.2-MATERIALS:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

Filter layer material shall meet the quality and gradation requirements of 704.7 or Class 10 aggregate. Quality sampling and testing shall be the responsibility of the Division if the material is not from an approved source. Gradation sampling shall be performed at a minimum of one sample per day of production or delivery. Gradation results from the production source will be acceptable. The contractor shall provide the gradation test results within three days of delivery.

218.4-FOUNDATION PROTECTION:

218.4.1-Scour Protection:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

This work shall consist of construction of a filter layer between the underlying soil and the rock lining of the ditch to prevent erosion at the soil/rock interface. A filter layer provides a transition between big rocks on the surface of the channel and the soil.

218.7-PAY ITEMS:

ADD THE FOLLOWING TO THE TABLE:

ITEM	DESCRIPTION	UNIT
218006-001	Filter Layer	Cubic Yard (meter)

~~April 16, 2019~~ August 7, 2019

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 607
GUARDRAIL

DELETE ITEM 607027 AND REPLACE ITEM 607046 ~~FROM~~ IN THE TABLE:

607.8-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
~~607027-*~~	~~Bullnose Attenuator~~	~~Each~~
607046-*	7 In Round X 6 Ft (175 Round X 1800 mm) Treated Wood Post Note 1	Each
Note 1: For repair and replacement of existing round treated wood post only.		

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 636
MAINTAINING TRAFFIC

636.20-TEMPORARY TRAFFIC SIGNAL(S) OR TEMPORARY LIGHTING:

ADD THE FOLLOWING:

636.20.1-Temporary Closed Circuit Television (CCTV): This work shall consist of furnishing, installation, maintaining, and removing a fully-installed and operational temporary video camera (CCTV) system. The Contractor shall furnish and assemble all necessary materials and equipment for each CCTV as described below to provide a complete operational system that can be viewed and operated by those with appropriate permissions.

1. The CCTV shall include a Pan-Tilt-Zoom (PTZ) CCTV Camera, autonomous (24/7/365) and meet the requirements of this special provision. This item shall also include furnishing software and interfaces required to provide streaming video with PTZ controls to the WV DOH TMC as well as include a public web page for the CCTV units on this project for the general public to view streaming video in a format approved.

2. CCTV assembly shall be mounted to a round wood pole with a minimum height of 45 feet. All wood poles shall meet the requirements of Section 710.8 of the Standard Specifications.

3. All equipment and materials shall be new. All equipment shall be the latest model and shall contain the latest firmware unless it can be shown that an earlier version is required for compatibility with existing WVDOH communication protocols.

4. The cabinet/enclosure shall be a NEMA 4X stainless steel enclosure. The cabinet/enclosure shall have a continuously hinged door on one side, and shall be provided with a standard, #2 keyed brass lock. The enclosure shall be sized by the contractor that will provide ample space for all electrical connections, bus bar, surge protection, cellular

modem/antennae, H.264 encoder, and all other functional equipment pertinent to the operation of the CCTV.

5. The Contractor shall provide a separate power conductor from the nearest power control station or other pertinent power service as approved by the Engineer. Any conductor deriving power from a light source shall utilize a separate conductor to bypass any photocell control.
    a. The Contractor shall size this conductor so that there is less than a 5% power loss from the control station to the CCTV.
    b. The CCTV power conductor shall be distinctive from all other conductors within the existing raceway(s).

6. Unless otherwise specified, ground wiring shall be solid bare copper #4 AWG and securely connected inside enclosures with #4 AWG copper clamp connectors. Nuts and washer securing the wire are not acceptable. All grounding shall meet the National Electric Code. Ground wires shall be exothermically welded to the ground rods. Ground rod clamps are not acceptable. The following devices shall be grounded:
    a. Cabinet
    b. Camera system
    c. Communications

    The resistance to ground shall be less than 10 Ohms as measured with a ground resistance meter or equivalent.

7. All cellular communications (SIM cards) will be provided by the Department along with the all associated cellular costs. The CCTV, video interfaces, all appurtenances, software and documentation, training of Department and Project personnel and the acceptance testing of all equipment and interfaces shall be included.

8. The CCTV shall be equipped with a 4G/LTE digital cellular modem operational on a commercial cellular communication network that accepts Department provided SIM cards and provides reliable statewide broadband connectivity.

9. The Contractor shall provide a CCTV that includes all software required to provide communications with the TMC, provide remote configuration of the CCTV from the TMC, and permits full IP PTZ camera control and viewing at the TMC.

10. The Contractor shall set up the IP addressable CCTV camera to stream at a minimum of 1 frames per second and shall work with WV DOH TMC and IT Departments to integrate the camera into their current systems and to provide the highest image resolution achievable utilizing the wireless link.

11. The camera shall provide the ability to control and monitor CCTV video over wireless IP networks.

12. The zoom ratio shall be 12x Optical Minimum.

13. The camera shall have an auto focus with manual override capability.

14. The CCTV camera shall display up to four preset zones, each with a unique and descriptive title.

15. The Contractor shall program each CCTV camera with a minimum of two preset zones: Upstream and Downstream Traffic.

16. The CCTV camera shall display a minimum of 20 programmable characters for on-screen camera ID, location & titles.

17. The camera PT unit shall provide a proportional speed Pan/Tilt capability, where the speed decreases automatically as the zoom level increases.

18. The camera PT unit shall provide a 360° continuous pan rotation without cable interference or tangling.

19. The camera shall provide a minimum of 720H x 480V High Definition pixels.

20. The camera shall provide compressed video output compliant with H.264 (MPEG-4 Part 10/AVC) and Motion JPEG standards.

21. The camera shall have Color and Black & White video image display modes with both automatic and manual selection. The camera shall transition automatically to a Black & White mode (when in automatic mode) when the luminance reaches a predefined threshold (used during evening hours or periods of low luminance).

22. The CCTV camera image display shall vary between day and night by reverting to quasi-monochrome operation at night for increased sensitivity. At all times the camera shall provide a full motion video output with controllable frame rate of up to 30 frames per second for both H.264 and Motion JPEG. Long-term image integration is not acceptable.

23. The CCTV camera shall incorporate electronic image stabilization to reduce the effects of vibration and wind gusts on the displayed video image.

24. The camera shall include both automatic iris control and an override for manual iris adjustments.

25. The camera shall have password protection, IP address filtering, HTTPS encryption, IEEE 802.1X network access control, digest authentication, user access log.

26. The camera shall provide video access using a standard web browser to view live camera video.

27. The camera shall provide a RJ-45 Ethernet 10BASE-T/100BASE-TX connector that is IP66-rated.

28. The camera manufacturer shall have a minimum of 12 installed units of CCTV cameras at outdoor installations for ITS applications, operational for at least six (6) months. Qualification list of installations for the camera vendor shall be submitted at the preconstruction meeting.

29. Unless otherwise specified, the equipment inside the CCTV shall remain functional with outside temperatures ranging from -34° C to 74° C (-29° F to 165° F).

30. Unless otherwise specified, the equipment inside the CCTV shall remain functional with an outside relative humidity from 0-100%.

31. The maximum total weight for the combined CCTV camera assembly shall be 5 lbs. or less.

32. The power input requirements for the CCTV camera shall be sufficient to power the IP CCTV camera and heater to permit camera operation throughout the temperature range defined above.

33. The Contractor shall furnish all necessary software to permit WV DOH to configure the IP CCTV camera. All software installed shall be licensed for use throughout WV DOH.

34. The Contractor shall setup the CCTV cameras to allow real-time viewing of the camera video, pan/tilt/zoom control, camera control, and camera configuration and setup using the latest version of Internet Explorer. The Department will provide and setup the IP address (or host name) of the camera as well as provide usernames and passwords for the Contractor to configure each CCTV. The Contractor shall provide video for the WV DOH TMC web page per the requirements below unless directed otherwise by the WV DOH ITS Engineer.

35. The video from the cameras shall be provided in a format able to be displayed at the WV DOH TMC and on the project web page at a rate of at least 1 frame per second.

36. The system shall allow WV DOH authorized personnel to control the camera through a web-based interface to the camera's pan-tilt-zoom controls.

37. The video shall be viewable through the web page and shall have a minimum viewing size of 720x480 pixels.

38. The video format shall provide a stream to permit the video to be posted to the WV DOH TMC.

39. The Cellular 4G/LTE Gateway Modem shall provide full duplex data communications between the CCTV installation sites and the WV DOH TMC over WV DOH's cellular carrier. The Department shall make all provisions for setting up cellular service and

configuring all equipment for end-to-end communications and provide that to the Contractor and assist with any questions related to this effort.

40. The 4G/LTE Gateway Cellular Modem shall be compatible with the data communications equipment installed at the CCTV installation sites and at the WV DOH TMC.

41. The 4G/LTE Gateway Cellular Modem shall include the following data communications security features:
    a. IP Sec VPN encryption technology; 3DES and AES encryption, typical
    b. An integrated application inspection firewall
    c. GRE tunneling
    d. HTTPS

42. The 4G/LTE Gateway Cellular Modem shall include an antenna input for reception of GPS positioning and timing information.

43. The 4G/LTE Gateway Cellular Modem may include an integrated 4-Port Hardened Ethernet Switch for future use.

44. The 4G/LTE Gateway Cellular Modem shall meet or exceed the following power and environmental requirements:

45. The modem shall have an operating temperature range of -13°F to 140° F and a humidity range of 5% to 95% non-condensing.

46. Antenna and Antenna Cabling Requirements for the 4G/LTE Gateway Cellular Modem:

47. The Contractor shall provide and install an external omni-directional 4G/LTE antenna and an external GPS antenna for the 4G/LTE Gateway Cellular Modem.

48. The antennas shall be mounted on the wood pole in a manner to provide continuous cellular communications and good reception of cellular signals.

49. Prior to delivery of the equipment and after receipt of the Department furnished and activated SIM cards, it is expected that the Contractor will conduct in-house factory testing of all the individual components as well as an end-to-end testing of the entire system including hardware, communication and software. The Contractor shall provide appropriate proof of testing prior to the delivery of the equipment.

50. The operational testing phase is intended to provide WV DOH personnel the opportunity to independently operate the CCTV based upon procedures provided at the training session by the Contractor. The operational testing phase shall be completed within five (5) calendar days upon completion of the training sessions. During this period, the Contractor shall provide technical support to address any questions or concerns encountered by WV DOH while operating the equipment. Any equipment issues and/or malfunction identified by WV DOH, either with the hardware, communication or software, shall be resolved by the

Contractor to the satisfaction of WV DOH within 10 business days. Any equipment malfunction identified by WV DOH not resolved by the Contractor may result in that equipment being identified as being "not accepted" by WV DOH.

636.25-PAY ITEMS:

ADD THE FOLLOWING ITEM TO THE TABLE:

ITEM	DESCRIPTION	UNIT
636035-001	Temporary CCTV	Month

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

107.21-PROTECTION OF RIVERS STREAMS AND IMPOUNDMENTS:

ADD THE FOLLOWING SUBSECTION TO THE PROPOSAL:

107.21.4-Increasing Impervious Areas and MS4 Requirements: The Contractor is advised that this project is located within an urbanized area with respect to the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit. The Contractor is advised that any proposed changes or substitutions to the Project may require additional storm water management mitigation and any costs associated with such mitigation shall be borne by the Contractor at no additional cost to the Division. The Contractor shall allow the Division and the local MS4 Agency seven (7) Calendar days to review and comment on such changes. Additionally no changes or substitutions will be permitted without approval from the Engineer.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 406
HIGH FRICTION SURFACE TREATMENT

406.1-DESCRIPTION:

This work shall consist of the construction of a high friction surface treatment (HFST) material, composed of binder material and aggregate, upon an existing surface, in accordance with these Specifications and in reasonably close conformity with the lines, grades, thicknesses, and cross sections shown on the Plans or established by the Engineer.

The contractor shall notify the Engineer a minimum of two weeks prior to starting any high friction surface treatment operation.

406.2-MATERIALS:

The binder shall be a multi-component modified exothermic polymer resin binder treatment. The binder shall cure exothermically and hold the aggregate firmly in position and meet the following requirements:

TABLE 406.2a-MULTI-COMPONENT MODIFIED BINDER RESIN SYSTEM

Property	Test Method*	Specification Limits
Viscosity	ASTM D2556	7 – 30 P
Durometer Hardness	ASTM D2240	60 - 80
Cure Rate (Dry through time)	D1640	3 hours max.
Adhesive Strength	ASTM C1583	250 PSI min. (100% substrate failure)
Compressive Strength		1000 psi (@ 3 hours 5000 psi @ 7 days
Elongation at break point	ASTM D-638	30% min.
Gel Time	ASTM C-881	10 minutes min.
Water Absorption	ASTM D-570	1 % max.
Mixing Ratio	Per Manufacturer's Recommendations	

TABLE 406.2a-MULTI-COMPONENT MODIFIED BINDER RESIN SYSTEM

*Additional testing notes for laboratory: Prepare all samples per manufacturer's recommendation.

- Viscosity – prepare one pint sample and mix for 2 to 3 minutes before testing. Use X1.1 for spindle selection and test at a temperature of 73 ± 2°F.
- Gel Time – Prepare a 60 g sample per manufacturer's recommendation. Perform testing at a temperature of 73 ± 2°F.
- Cure Rate – Prepare specimens of 50-55 wet mil thickness.
- Cure the following test specimens for 7 days at 73 ± 2°F, and test immediately without delay.
- Durometer Hardness – Use the type 1 precision type D method.
- Compressive Strength – Prepare specimen according to Method "B", 2" x 2" cube, using 2.75 parts of sand to one part mix polymer resin by volume. Sand must conform to ASTM C778, 20-30 sand.
- Ultimate Tensile Strength Prepare Type 1 specimens in accordance to ASTM D638.
- Elongation at break point – Prepare Type 1 specimens in accordance to ASTM D638.

The aggregate shall be bauxite material that is clean, dry and free from foreign matter and meets the following requirements:

TABLE 406.2b-AGGREGATE

Property	Test Method*	Specification Limits
SFC – Side Force Coefficient	ASTM E670~~-94 -0~~	0.70 minimum
SRV/SRT – Skid Resistance Value Test	ASTM E-274	65.0 mm min (70 mm)
AAV-Aggregate Abrasion Value	AASHTO T96	20.0 max.
Aggregate Gradation	AASHTO T27	95.0–100.0% Passing No. 6 0.0-5.0 % Passing No. 16
Aluminum Oxide Content	ASTM C-25	87% min
* As an option, and with approval of the Engineer, the current edition of a corresponding AASHTO test may also be used in lieu of any ASTM test.		

406.2.1-Quality Control Testing: Quality control is the responsibility of the Contractor as specified in 106.1.

The contractor shall design a quality control plan in accordance with applicable section of MP307.00.50, excluding attachment 1, detailing the methods by which the quality control program will be conducted. Samples shall be obtained at a minimum frequency of one sample per day of aggregate placement.

406.3-ACCEPTANCE TESTING:

Acceptance sampling and testing of aggregates is the responsibility of the Division, except for furnishing the necessary materials. Quality control sampling and testing performed by the Contractor may be used by the Division for Acceptance.

406.3.1-Skid Testing: Skid testing will be conducted within 90 days of complete installation, by the Division or an independent testing firm at the discretion of the

Division.~~;~~ Skid testing will be performed with the ribbed tire as prescribed in AASHTO T242 *Frictional Properties of Paved Surfaces Using a Full-Scale Tire.* An average ~~a~~ skid value of less than 69 will be deemed unacceptable and will require reinstallation of the complete surface system of the failed test section as defined in AASHTO T242 at no cost to the Department.

The installed system will also be tested for skid resistance 12-14 months after initial test; an average value less than 64 will be deemed unacceptable and will require reinstallation of the complete surface system of the failed test section as defined in AASHTO T242 at no cost to the Department. The Contractor shall obtain a 2 year Warranty Bond in the amount of original Contract Bid amount for this item (item number 406001-001) at final inspection.

406.3.2-Acceptance for the Grading of Aggregate: Acceptance for gradation shall be on the basis of test results on consecutive random samples from a lot. A lot shall be considered the quantity of material represented by an average test value, not to exceed five sublots. Generally at the beginning of the project, the average shall be started on the second sample in accordance with MP 300.00.51. A sublot is the quantity of material represented by a single gradation test. In the case where only one sample is taken, this sublot shall be considered the lot. The material shall be sampled and tested in accordance with the applicable specification. The gradation test results shall be plotted on a control chart in accordance with MP 300.00.51. When the average, or when the most recent three consecutive individual test values fall outside the guidelines for this aggregate the lot of material represented will be considered nonconforming to the extent that the last of its sublots is nonconforming. When this occurs, the last sublot shall have its price adjusted in accordance with Table 406.12.1. In the case where the average is nonconforming and the last sublot contained is conforming, then there would be no price adjustment. In no event, however, shall a sublot of material have its price adjusted more than once, and the first adjustment, which is determined, shall apply.

406.3.2.1-Degree of Nonconformance: When a sublot of material is to have its price adjusted, the percentage point difference between the nonconforming test value and the specification limit shall be determined for each sieve size determined to be nonconforming and this value shall be multiplied by its appropriate multiplication factor as set forth in Table 406.3.2.1 to determine the degree of nonconformance on that sieve.

TABLE 406.3.2.1

Nonconforming Sieve Size	Multiplication Factor
No. 6 (3.35mm)	1.5
No. 16 (1.18mm)	2.0

The total measure of nonconformance of an individual sublot is the sum of all nonconformances on the various sieve sizes of that sublot. When the total degree of nonconformance has been established and it is 12.0 or less, the material will be paid for at an adjusted contract price as specified in Table 406.11.1. When the degree of nonconformance is greater than 12.0, the nonconforming sublot shall be resolved on an individual basis, requiring a special investigation by the Engineer to determine the appropriate course of action to be followed.

CONSTRUCTION METHODS

406.4-WEATHER RESTRICTIONS:

The polymer binder material shall not be placed on a wet surface, when the ambient air or surface temperature is either *below 50 degrees Fahrenheit or ambient temperature above 110 degrees Fahrenheit, or when the anticipated weather conditions or pavement surface temperature would prevent proper application of the surface treatment as determined by the Engineer in consultation with the manufacturer's representative.

*Applications below 50 degrees Fahrenheit will be considered acceptable if the manufacturer can demonstrate a cure rate (dry through time) of <3 hours at current field conditions.

Do not place the HFST with visible moisture on the prepared surface at the time of placing. Test for moisture in the pavement by taping an 18"x18" plastic sheet to the pavement per ASTM D4263. Perform the plastic sheet test only when surface temperatures and ambient conditions are within the established parameters for application of the overlay system. In the event of rain, the pavement must be allowed to air dry prior to performing the plastic sheet test. A 2 hour minimum test duration is allowed in lieu of the 16 hours specified in ASTM D4263.

406.5-PLACING:

The Contractor shall ensure that a manufacturer's representative is on site to provide technical assistance during the startup operations and as necessary during the surface preparation, material placement and during any necessary remedial work.

The contractor shall cover and protect all existing pavement markings and utilities that are left in place prior to placement. All inadequately sealed joints and cracks greater than ¼" shall be cleaned and filled with a crack sealant approved by the polymer resin manufacturer.

For applications on new asphalt pavements, install the polymer binder and high friction aggregate topping a minimum of 30 days after placement of the new pavement.

Surfaces shall be clean, dry, and free of all dust, oil, debris and any other material that might interfere with the bond between the polymer resin binder material and existing surfaces. Adequate cleaning of all surfaces will be determined by the manufacturer's representative. Utilities, drainage structures, curbs and any other structure within or adjacent to the treatment location shall be protected from the application of the surface treatment materials. Cover and protect all existing pavement markings that are adjacent to the application as directed by the Engineer. Pavement markings that conflict with the surface application shall be removed by grinding and the surface shall be swept clean prior to the polymer binder application.

Clean concrete pavement surfaces by shot blasting and vacuum sweeping. Shot blast all surfaces to remove all curing compounds, loosely bonded mortar, surface carbonation, and deleterious material. Ensure that the prepared surface complies with the International Concrete Repair Institute (ICRI) standard for surface roughness CSP 5. After shot blasting, vacuum sweep or air wash, with a minimum of 180cfm of clean and dry compressed air, all surfaces to remove all dust, debris, and deleterious material. Maintain air lance perpendicular to the surface and the tip of the air lance within 12 inches of the surface.

Utilities, drainage structures, curbs, and any other structures within or adjacent to the treatment location must be protected against the application of the HFST materials.

When magnesium phosphate concrete is placed prior to the HFST bridge deck overlay, the magnesium phosphate concrete must be placed at least 72 hours prior to placing the polymer resin binder.

When modified high alumina based concrete is placed prior to the HFST bridge deck overlay, the polymer resin binder must not be placed on the concrete until at least 30 minutes after final set of the modified high alumina based concrete.

Expansion joints and deck drains must be adequately isolated prior to applying HSFT.

All debris, excess aggregate, material containers, and other waste shall be disposed of off the Right-of-Way according to Section 207 by the Contractor at no direct cost to the Department.

Any roadway features disturbed by the work of the Contractor's operations shall be restored in kind by the Contractor and approved by the Engineer at no cost to the Department.

406.5.1 - Mixing and Application:

The HFST must conform to the following:

1. Surface preparation work, surface temperature, placement of the HFST must be in conformance with the binder supplier's specifications, these special provisions and as approved by the Engineer.
2. The spread rate range for polymer resin binder shall be 3-3.5 sq yd./gal.
3. The spread rate range of retained aggregate shall be 13-20 lb/sq yd.
4. HSFT must be allowed to cure for the minimum duration as recommended by the supplier's specifications and during that time the application area must be closed to all traffic including Contractor's equipment.

Mechanical Application:

The applicator equipment must be capable of placing the resin binder and high friction aggregate, at the spread rates limits defined above, in a single pass. It shall provide adequate capacity of aggregate and resin binder capable of placing 1,500 lineal feet of HFST.

The polymer binder shall be blended and mixed in the ratio per the manufacturer's specification (+/- 2% by volume); the polymer binder shall be continuously applied once blended.

The mechanical aggregate spreader shall be capable of applying up to a continuous 12 foot width application. The high friction aggregate shall begin within 20 seconds (+/- 1 sec) of the base polymer binder application onto the pavement section. Complete coverage of aggregate shall be completed within 60 seconds of the resin binder contacting the pavement. No exposed wet spots of the polymer binder shall be visible once the aggregate is installed.

The operations shall proceed in such a manner that will not allow the mixed material to separate, cure, dry, be exposed or otherwise harden in such a way as to impair retention and bonding of the high friction surfacing aggregate, walking, standing or any form of contact or contamination with the wet uncured resin will result in that section of resin being removed and replaced at the contractor's expense.

Hand Application:

Hand application acceptable only for areas deemed to be low volume and less than 300 feet in length, unless otherwise noted in the plans. The resin binder and aggregate shall be placed at the application limits defined above.

The resin binder shall be mixed in accordance to the manufacturer's recommendations and uniformly spread over the surface. The high friction aggregates shall be completed within 60 seconds of the resin binder contacting the pavement. No exposed wet spots of the polymer binder shall be visible once the aggregate is installed.

406.6-CLEANING AND SWEEPING & RECOVERED AGGREGATE:

Excess and loose aggregate must be removed from the traveled way and shoulders by street sweeping. Application of HFST requires a second street sweeping 24-48 hours after application. All cost for street sweeping shall be included in HFST pay item.

The excess aggregate may be recovered and reused. The excess aggregate shall be recovered by a mechanical sweeper and shall be clean, dry and uncontaminated. Aggregate shall not be recovered from areas that were not previously cleaned.

The recovered aggregate may be used at a rate no higher than 1 part recovered aggregate to 2 parts virgin aggregate. The recovered aggregate and virgin aggregate shall be a homogenous blend and is subject to sampling and testing for gradation.

406.7-ENVIRONMENTAL REGULATIONS

All regulations of the State of West Virginia shall be met involving the storage, application and disposal of all materials on the project.

406.8-JOINTS:

The longitudinal construction joints between adjacent lanes shall be kept clean of material foreign to the type of surface being treated. The joints shall be constructed without overlaps or gaps between the materials.

The transverse joint at the end of successive sections or lanes shall be adequately protected to prevent overlapping of the binder material. Following its use, the materials shall be removed and disposed of satisfactorily.

406.9-PROTECTION OF PAVEMENT AND TRAFFIC CONTROL:

The Contractor shall be responsible for the protection of the surface against damage by their equipment and personnel. Traffic shall not be permitted on any part of the work under construction until the treatment has cured sufficiently to prevent raveling or pickup under traffic. The applicable provisions of 636 shall apply for regulating traffic.

406.10-METHOD OF MEASUREMENT:

No materials shall be removed from the Project for any purpose until the operation has been completed and the quantities of materials incorporated into the operations have been determined, except when authorized by the Engineer.

The Quantity of “High Friction Surface Treatment”, when specified to be paid by the square yard, shall be measured by the total area the surface treatment is applied measured in place and accepted.

When items for maintaining traffic are included in the Contract, they will be measured and paid as provided in Section 636.

406.11-BASIS OF PAYMENT:

The quantities, determined as provided above, will be paid for at the contract unit prices bid for the items listed below, which prices and payments shall be full compensation for furnishing all the materials and doing all the work described above in a workmanlike and acceptable manner, including all labor, tools, equipment, supplies, and incidentals necessary to complete the work.

The Quantity of "High Friction Surface Treatment" when specified to be paid by the square yard shall include the cleaning and sweeping, binder material, aggregate and all labor and equipment required to perform the operation

406.11.1- Price Adjustment: Aggregates not conforming with the requirements of gradation as described in TABLE 406.2b-AGGREGATE will be paid for at the adjusted contract price based on the degree of nonconformance as specified in Table 406.11.1.

TABLE 406.11.1

Adjustment of Contract Price for Gradation Not Within Specifications	
Degree of Nonconformance	**Percent of Contract Price To Be Reduced**
1.1 to 3.0	2
3.1 to 5.0	4
5.1 to 8.0	7
8.1 to 12.0	11
Greater than 12	*
* The Division will make a special evaluation of the material and determine the appropriate action.	

406.12-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
406001-001	High Friction Surface Treatment	Square Yard (Square meter)

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 103
AWARD AND EXECUTION OF CONTRACT

103.5-REQUIREMENT OF CONTRACT BOND:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE THE FOLLOWING:

At the time of the execution of the contract, the successful bidder shall execute and deliver to the Division a good and sufficient surety or collateral bond payable to the State of West Virginia in the amount of 100 percent of the contract price.

~~The successful bidder has the option of submission of the aforementioned bond in an amount equivalent to either 102 percent or 100 percent of the contract price.~~

~~The submission of the aforementioned bond in an amount equivalent to 102 percent of the contract price by the successful bidder is the standard expectation of the Division in order to comply with the current Special Provision for Subcontractor Prompt Payment and does not necessitate the withholding of retainage by the Division from monies due on future progress voucher estimates payable under the terms of the contract. Further, the decision by a particular contractor to submit said bond in an amount equivalent to 102 percent of the contract price shall be consistent and applicable throughout the duration of the contract for which the bond is being submitted and shall be consistent and applicable to all contracts executed between the Division and that particular contractor.~~

~~If the successful bidder elects to submit the aforementioned bond in an amount equivalent to 100 percent of the contract price, it is necessary that the bidder notify the Contract Administration Division in writing prior to the submission of the bond. Submission of a bond in an amount equivalent to 100 percent of the contract price does necessitate the withholding of retainage by the Division from monies due on future progress voucher estimates payable under the terms of the contract and as set forth in 109.6. Further, the decision by a particular contractor to submit said bond in an amount equivalent to 100 percent of the contract price shall be consistent and applicable throughout the duration of the contract for which the bond is being submitted and shall be consistent and applicable to all contracts executed between the Division and that particular contractor.~~

As an alternate, the successful bidder may deposit with the State Treasurer cash bond, United States Treasury bonds, United States Treasury notes, United States Treasury Certificates

of Indebtedness, United States Treasury bills or West Virginia Road Bonds in the amount of ~~either 102 percent or~~ 100 percent of the contract amount. A safe keeping receipt from a bank located in the State of West Virginia may be deposited with the State Treasurer in lieu of any of the definitive securities.

~~The State Treasurer shall, on a regular basis, collect all interest or income on the obligations so deposited and shall pay same, when and if collected, to the Contractor who deposited the obligations. If the deposit is in the form of coupon bonds, the State Treasurer shall deliver each coupon as it matures to the Contractor.~~

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 109
MEASUREMENT AND PAYMENT

109.6-PARTIAL PAYMENTS:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE THE FOLLOWING:

The Engineer will make current estimates in writing, once each month on or before the date set by the Engineer at the time of starting the work, or from time to time as the work progresses, of the materials complete in place and the amount of work performed in accordance with the Contract, during the preceding month or period and the value thereof figured at the unit prices contracted. Current estimates may be prepared for payment on a semi-monthly basis at the discretion of the Engineer when the amount due the Contractor for work during the semi-monthly period exceeds $10,000. Should there be any doubt by the Engineer as to the integrity of any part of the completed work, the estimates for that portion will not be allowed until the cause for such doubt has been removed.

~~As set forth in 103.5, paragraph four, if the successful bidder submits a good and sufficient surety or collateral bond payable to the State of West Virginia in~~ From the total of the amounts ascertained as payable, an amount equivalent to ~~100 percent of the contract price, an amount equivalent to two~~ ten percent (10%) of the whole will be deducted ~~from the total of the amounts ascertained as payable and will be~~ and retained by the Division until the completion of the entire Contract in an acceptable manner. The balance, or an amount equivalent to ~~98~~ ninety percent (90%) of the whole, less all previous payments, will be certified for payment.

When the work under contract has been completed and its acceptance is recommended by the Engineer, and upon written request by the Contractor accompanied by proper release by the Contractor's surety, a part of the ~~two~~ ten percent retained as outlined above, in an amount determined by the Engineer, may be released and paid the Contractor. A minimum of ~~0.5% (zero point five percent)~~ two percent (2%) of the approximate total final contract amount will be retained until payment of the final estimate.

~~Unless otherwise requested by the Contractor in writing, all amounts retained by the Division will be invested in the Consolidated Investment Fund of the State of West Virginia with interest accrued in the name of the Contractor. Dividends will be paid annually and a service fee as determined by the Fund will be deducted from the interest earned.~~

~~Substitution of Securities for Retainages:~~

~~i The Contractor may, from time to time, withdraw the whole or any portion of the amount retained for payments to the Contractor, under the Contract, with the written release from Contractor's surety, pursuant to the terms of the Contract, notwithstanding the provisions above, upon depositing with the State Treasurer, United States treasury bonds, United States treasury notes, United States treasury certificates of indebtedness or United States treasury bills, or bonds or notes of the State of West Virginia. A safe keeping receipt from a bank located in the State of West Virginia may be deposited with the State Treasurer in lieu of any of the definitive securities. No amount shall be withdrawn in excess of the market value of the securities at the time of deposit or of the par value of the securities, whichever is lower.~~

~~ii The State Treasurer shall on a regular basis, collect all interest or income on the obligations so deposited and shall pay the same, when and as collected, to the Contractor who deposited the obligations. If the deposit is in the form of coupon bonds, the State Treasurer shall deliver each coupon as it matures to the Contractor.~~

~~iii Any amount deducted by the State, or by any public department or official thereof, pursuant to the terms of the Contract, from the retainages due the Contractor, shall be deducted, first from that portion of the retainages for which no security has been substituted then from the proceeds of any deposited security. In the latter case, the Contractor shall be entitled to receive interest, coupons or income only from those securities which remain after such amount has been deducted.~~

~~iv~~i Any Contractor who has substituted a security or securities for retainages and the same matures before the completion and finalling of the Contract for which the security or securities were substituted for retainages may, from time to time, substitute another security or securities for the one or ones having so matured in the same manner that the original security or securities were substituted so long as the substituted security or securities are of a kind designated in (i) above, of equal value to the matured security or securities for which it is substituted. All interest and income accruing on such substituted security or securities shall be collected and paid and the security or securities themselves shall be held, handled and delivered by the State Treasurer in the same manner, as is provided in (ii) and (iii) above, for the original security or securities deposited.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 501
PORTLAND CEMENT CONCRETE PAVEMENT

501.1-DESCRIPTION:

ADD THE FOLLOWING:

Work under this item includes construction of truck apron using integral concrete pavement color, pattern, textural surface, ~~dry - shake color hardener,~~ test slabs, and application of a sealant solution.

Work under this item also includes furnishing and installing joints in accordance with the plans and this specification.

501.2-MATERIALS:

ADD THE FOLLOWING:

Class DC concrete shall be used. Concrete must have a minimum 28-day compressive strength of 4500 psi concrete for the truck apron, with a maximum aggregate size of 1/2 “. The cement must be from the same mill, raw material type, and brand for all the ~~stamped~~ patterned concrete and test slab in order to make colors uniform.

The pattern and color of concrete shall be as noted in the plans.

~~Patterns: Use the following pattern or approved equal:~~

~~WVDOH TO PROVIDE PATTERN~~

~~Color: Use the following color or approved equal:~~

~~WVDOH TO PROVIDE COLOR~~

Colored ~~Admixture~~ Concrete: An admixture of special pigments designed to provide a full-depth color to the finished concrete shall be utilized at the locations shown within the Contract Plans. The admixture shall ~~Shall~~ contain colored, water-reducing, coloring agents that are lime proof and UV resistant, and without calcium chloride. The color admixture shall conform to the requirement of ASTM C979 ~~and ASTM C494~~.

Prior to the start of construction, the Contractor shall submit to the Engineer for approval the proportion of materials, including the admixture of special pigments, to be used. The aggregate, cement and integral color shall be from same source throughout the entire project. The material sources and mix proportions used during the project shall be accurately recorded and furnished to the Engineer throughout the project. Certified test reports of the pigment showing compliance with ASTM C 979 shall be submitted. Color pigments shall be light fast, wettable, weather resistant, alkali resistant and free of deleterious fillers and extenders.

Batching, mixing, finishing and curing shall be in accordance with the manufacturer's recommendations, the Standard Specifications and the Contract Documents. In case of conflict, the Contractor shall submit proposed methods to Engineer for approval.

Curing and Sealing Compound: ~~SCOFIELD® Cureseal-W™ [SEMI GLOSS] or approved equal.~~ Curing and sealing compound shall conform to requirements of ASTM C309 and match~~ing~~ the color admixture manufacturer, for use with integrally colored concrete.

Release Agent: The Contractor shall use a release agent per recommendation of the ~~Pattern~~ pattern tool manufacturer ~~recommended~~ and compatible with integral color additives.

~~**Dry-shake Colored Hardener:** LITHOCHROME® Color Hardener or approved equal. As recommended by the pattern tool manufacturer and of a heavy duty grade.~~

~~Performed expansion joint filler shall conform with Article M.03.01 Part 5.(b).(1).~~

~~Dow Corning 888 or 890-SL~~

~~Manufactured by: The Dow Corning Corporation~~
~~P.O. Box 994~~
~~Midland, MI 48686-0994~~

~~Other silicone joint sealants expressly manufactured for use with the concrete will be considered for use provided they are submitted in advance for approval to the Engineer. Other joint sealants will be considered for use only if a complete product description is submitted, as well as documentation describing at least five installations of the product has performed successfully for at least three years under traffic conditions.~~

Backer Rod: An open-cell type rod with an impervious skin that will not outgas when ruptured. Use the backer rod together with the joint sealant. Select one of the following or an Engineer approved equal:

1. SOF ROD, manufactured by Nomaco, Inc.,

2. CERA-ROD, manufactured by W.R. Meadows, Inc.,
3. Sandells Open-Cell Backer Rod, manufactured by Sandell Mfg. Co., Inc.

501.3-CONSTRUCTION METHODS

ADD THE FOLLOWING:

The Contractor shall have at least five (5) years of experience performing the installation of patterned and colored concrete ~~on various state and/or municipal contracts~~. The ~~prime~~ Contractor shall submits a minimum of five (5) references proving the satisfactory completion of such work performed ~~by the concrete contractor within~~ seven (7) calendar days ~~of the award of the contract~~ before starting work for Engineer approval. The submittal shall include the names, addresses, and phone numbers of the personnel responsible for the administrating the contracts, and the location of the prior work. ~~If the Engineer determines that the Contractor proposed has insufficient experience, or has performed unsatisfactory work on other contracts, the prime Contractor will be required to resubmit documentation for an alternate contractor for the approval of the Engineer.~~

TEST SLABS: Cast a patterned ~~stamped~~ and colored concrete test slab to show the pattern, texture relief, surface finish, color, and standard of workmanship. Minimum size is 5' X 5'. Construct the test slab the same methods as outlined in the above. Construction Methods and using the same Materials. The test slab shall be patterned. Include a repaired area of at least 1.5' X 1.5' to demonstrate the Contractors ability to match the color and texture to simulate damage during construction requiring repair. Produce, as Engineer directed, 1.5' X 5' test slabs in order to confirm a color before building the stamped 5' X 5' textured slab.

Build test slabs in locations directed by the Engineer. The construction of the patterned ~~stamped~~ concrete begins after the Engineer approves the test slab. Maintain the test slabs during construction, undisturbed, as a standard for judging the completed work. All test slabs shall be removed and disposed of then directed by the Engineer.

The patterned ~~stamped~~ concrete shall have a uniform and consistent color and pattern matching that of the approved test slab. Stamp patterns with respect to the joints to insure the stones in the pattern line up with the joint locations. Special procedures or stamping equipment may be required to construct the pattern on the circular truck apron. Follow all manufacturer's recommendations unless otherwise directed by the Engineer.

Schedule the concrete placement to avoid exposure to excessive wind and heat before applying curing materials. In the event of forecasted rain, snow, or frost within a 24 hour period of time, protect concrete from moisture, freezing, or thawing.

501.22-METHOD OF MEASUREMENT:

DELETE THE ENTIRE SECTION AND REPLACE WIH THE FOLLOWING:

This work will be measured for payment by the number of square yards of ~~Stamped~~ patterned and colored ~~C~~concrete constructed as shown on the plans and accepted by the Engineer. ~~Include test slabs, concrete cylinder test specimens, and joint material in the general cost of the work, which are not measured for payment.~~

501.23-BASIS OF PAYMENT:

~~DELETE THE FIRST PARAGRAPH OF SECTION ONE (CONCRETE: THIS MATERIAL WILL BE PAID…) AND REPLACE WITH THE FOLLOWING~~ ADD THE FOLLOWING:

~~This work shall be paid for at the contract unit price per square foot for Item 501005-010, "10 Inch Non-Reinforced Portland Cement Concrete Pavement", set in place.~~ The quantities will be paid for at the contract unit price, which ~~This price~~ shall include the cost of all materials, equipment, and labor necessary to place, color and pattern the concrete and to construct and properly dispose of test slabs.

No separate payment will be made for joints, dowel bars, joint sealer or filler.

501.24-PAY ITEMS:

~~DELETE THE FIRST PARAGRAPH OF SECTION ONE (CONCRETE: THIS MATERIAL WILL BE PAID…) AND REPLACE WITH THE FOLLOWING~~ ADD THE FOLLOWING:

ITEM	DESCRIPTION	UNIT
501005-010	"10 Inch Non-Reinforced Portland Cement Concrete Pavement", ~~set in place~~Patterned and Colored	Square Foot (Meter)

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 601
STRUCTURAL CONCRETE

601.3-PROPORTIONING:

601.3.2-Field Tolerances and Adjustments:

601.3.2.1-Consistency:

DELETE FOOTNOTE * OF TABLE 601.3.2 AND REPLACE WITH THE FOLLOWING:

TABLE 601.3.2 CONSISTENCY

*	If the consistency exceeds the target value plus one inch (25 mm), the Contractor shall take immediate steps to reduce the slump of succeeding loads by making necessary adjustments in the mixture. The Contractor will be allowed a reasonable time for the trucks already on the road for a central mix or truck mix operation. Failure to comply will be cause for rejection of the concrete. If the consistency exceeds the target value plus 1 ¾ inches (~~445~~ 43.75 mm), the concrete will be rejected.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 601
STRUCTURAL CONCRETE

601.1-DESCRIPTION:

ADD THE FOLLOWING PARAGRAPH:

Concrete Blocks may be used for temporary works or in permanent applications as nonstructural elements with low stress applications. Any combination of the above listed classes of concrete are acceptable. ~~When~~ Unless otherwise specified in the plans, lifting hooks shall be included on concrete blocks.

Size and shape of blocks will be based on the application and available materials. If the specified material size/shape are not available, the Contactor shall provide the Engineer a copy of ~~the manufacturers~~ available designs showing the dimensions, for approval, at no additional cost or time to the Division.

601.2-MATERIALS:

ADD THE FOLLOWING PARAGRAPH:

~~**Concrete blocks** shall meet the requirements of the following subsection:~~

~~MATERIAL~~	~~SUBSECTION~~
~~Concrete for Miscellaneous Uses~~	~~715.12~~

~~Acceptance will be based on visual inspection at the project site or at the fabricator's plant.~~

The defined application areas do not require defined concrete strength, air, and other concrete properties. Concrete blocks shall meet the requirements of 715.12 with the following addition:

iv. The concrete produced from recycled, or returned fresh concrete as defined by ASTM C1798 may be used. Concrete shall be free of miscellaneous debris.

Acceptance will be based on visual inspection at the project site.

601.10-PLACING CONCRETE:

ADD THE FOLLOWING PARAGRAPH:

Concrete blocks shall be placed at the locations indicated on the plans or as directed by the Engineer.

When specified for use as temporary works and no longer needed, they will become the property of the Contractor, unless noted in the Plans. Temporary blocks shall meet the requirements of Section 104.7.

601.14-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

The quantity of concrete blocks will be measured in cubic yards (meters), complete in place and accepted.

601.15-BASIS OF PAYMENT:

ADD THE FOLLOWING:

The quantities, determined as provided above, will be paid for at the contract unit price, which shall be full compensation for furnishing all the materials and doing all the work prescribed in a workmanlike manner, including all labor, tools, equipment, supplies, and incidentals necessary to complete the work.

601.16-PAY ITEMS:

ADD THE FOLLOWING TO THE TABLE:

ITEM	DESCRIPTION	UNIT
~~601027-001~~	~~Concrete Block, "size"~~	~~Each~~
601027-00~~2~~1	Concrete Block, "size"	Cubic Yard (meter)
"size" shall designate the size of the concrete block in Length x Width x Height dimensions. Example "Precast Concrete Block, 6' x 2' x 2' "		

~~June 25, 2019~~ September 30, 2019

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 607
GUARDRAIL

607.1-DESCRIPTION:

ADD THE FOLLOWING PARAGRAPH TO THE END OF SUBSECTION:

The Bridge Deck Mounted Guardrail System shall be fabricated and constructed as shown in the special details of the Plans.

607.4-ERECTING RAIL ELEMENTS:

ADD THE FOLLOWING SUB-SECTION:

607.4.6-Bridge Deck Mounted Guardrail System: This guardrail system shall be erected in accordance with the requirements of 607.4.2 and as shown on the Plans.

607.6-METHOD OF MEASUREMENT:

ADD THE FOLLOWING SENTENCE TO THE END OF FIRST PARAGRAPH:

The quantity of work done will be measured in linear feet (meters) of Bridge Deck Mounted Guardrail System of the type indicated on the special details in the Plans, complete in place and accepted, measured along the face of the rail from ~~center~~ splice to ~~center~~ splice outside of ~~end posts on~~ the bridge as shown on the plans.

607.8-PAY ITEMS:

ADD THE FOLLOWING TO THE TABLE:

ITEM	DESCRIPTION	UNIT
607048-003	Bridge Deck Mounted Guardrail System	Linear Foot (Meter)

June 28, 2019

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 614
PILING WALLS

614.5–CONCRETE OR GROUT:

DELETE THE THIRD PARAGRAPH IN THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

Concrete shall be in accordance with Section 601, Class B. ~~and the~~ The job site and A-bar testing ~~is~~ are waived.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 628
ROCK ANCHORS

628.1-GENERAL:

628.1.1-Description: This work shall consist of furnishing and installing rock anchors in accordance with this special provision, ~~FHWA Publication No. FHWA-IF-99-015~~ AASHTO LRFD Bridge Construction Specifications (4th Edition, 2017), and in reasonably close conformity with the dimensions, locations and details shown on the Plans or established by the Engineer.

628.1.2-Prequalification of Contractor: A contractor experienced in permanent rock anchor installation shall perform the rock anchor work. The anchor contractor's qualifications must be submitted to the Engineer fourteen (14) calendar days before rock anchor work begins. The following is a list of the requirements:

1. The contractor must be experienced in the design and construction of permanently anchored walls.
2. The contractor's staff shall include at least one registered Professional Engineer in the state of West Virginia with at least five years of supervisory experience in the design and construction of permanently anchored walls.
3. The foreman shall have a minimum of five years' experience in constructing permanently anchored walls.
4. The contractor shall have constructed (or have under construction) a minimum of five projects (in the last five years) that are similar in concept and scope to the proposed wall.

628.1.3-CONTRACTOR'S DESIGNS:

The Contractor shall prepare a complete design for the anchors they propose to use. This design shall conform to the criteria on the Plans, Specifications, and other documents referenced therein. The design shall be based on the Contractor's experience on similar work and on accepted practice described in ~~FHWA-IF-99-015 "Ground Anchors and Anchored Systems"~~ AASHTO

LRFD Bridge Construction Specifications "Section 6: Ground Anchors". The design shall also include the corrosion protection scheme for the tendon as well as the anchor head.

The Contractor is cautioned that the soil and rock information shown on the Plans is based on a limited number of borings. The actual conditions and elevations may differ from those shown.

Any design different from that shown on the Plans shall be prepared and sealed by a duly licensed Professional Engineer in the state of West Virginia. The design and working drawings shall be reviewed by the Engineer to confirm that the design meets the design requirements.

The Contractor may use a nominal (ultimate) grout-rock bond stress higher than 118 psi, provided that a field pullout test is performed by the Contractor to confirm the higher bond stress. The anchor to be pullout tested shall have a minimum bond length of 10 feet. The pullout test shall be done at no cost to the department. The requirement for the pullout test can be waived if the contractor shows a proof test result of anchors bonded in sandstone and installed in the vicinity of the project site. If the Contractor chooses to use a higher bond stress, the Contractor will be responsible for failed performance tests and/or proof test as a result of using a higher bond stress. The cost of installing and re-testing additional anchors will be the responsibility of the Contractor.

For alternate designs it shall be assumed that all structural parts shown on the Plans, such as wales, piles and connections, are fully stressed. Any additional stresses imposed on such structural parts and on the anchors themselves, due to design changes such as a steeper slope of the anchors, will require strengthening of various parts. Such strengthening shall be done at no cost to the Department, nor will the contract amount be reduced because of any shortening of anchors due to design changes.

628.2-MATERIALS:

Materials shall conform to the requirements specified in the following Subsections:

MATERIAL	SUBSECTION
Portland Cement	701.1
Fine Aggregate	702.1
Prestressing Steel	709.2
Structural Steel	709.12

Minimum grout strength at stressing shall be 3,500 psi. Expansion additives in grout will not be allowed. Grout shall not be re-tempered or used after it has begun to set. Proportioning, mix design requirements (including requirements for submission to the Department), quality ~~Quality~~ control, and testing of grout (including number, size and shape of samples) shall conform to the applicable provisions of Subsections 601.3 and 601.4.

All other materials, including sheaths, grease, tubes, centralizers and spacers, shall be of good quality, acceptable to the Engineer. The contractor shall submit Manufacturer's certificates and catalogs, tests reports or other such documents, as required by the Engineer.

628.3-PREPARATION OF ANCHOR:

The anchor tendons shall consist of seven-wire low relaxation strands. The tendons shall be fabricated in accordance with approved details and shall be free of dirt, or other deleterious substances. Light rust or rust stains that can be wiped off with a rag may be allowed. Prior to installation, they shall be handled and stored in such a manner as to avoid corrosion and physical

damage. Damage such as abrasions, cuts, nicks, welds, weld splatters, or heavy corrosion and pitting will be cause for rejection. Rejected tendons shall be replaced at no cost to the Department in terms of either material replacement or resulting time delay. Care shall be taken during handling and installation to prevent any sharp bends of the tendon.

Couplers and similar hardware should be avoided, but if their use is necessary, the grout cover shown in plans over the tendons shall be provided over hardware, too.

The bond length shall be degreased prior to installation.

A smooth, shop extruded, tight fitting polypropylene (or polyethylene) sheath will encapsulate the entire stressing length of each tendon. The sheath shall have a minimum wall thickness of 0.04 inches. The sheath should be heat shrunk onto the strand.

A grease film compounded to provide corrosion inhibiting and lubricating properties shall fill the space between the sheath and the stressing length of the tendons. The coefficient of friction between the steel tendon and the polypropylene shall not exceed 0.05. The contractor shall provide certified test data confirming that this coefficient of friction does not exceed 0.05. The allowable content of deleterious substances in the grease shall not exceed the following:

COMPOUND	TEST METHOD	MAXIMUM QUANTITY
Chlorides	ASTM D 512	2 ppm
Nitrates	ASTM D 992	2 ppm
Sulfides	APHA “Sulfides in Water”	2 ppm

Test samples are to be prepared in accordance to the following procedure:

1. Coat the inside (bottom and sides) of a liter glass beaker (dimensions approximately O.D. - 110 mm. Height - 144 mm) with 100 ± 10 grams of grease.
2. Fill beaker with a measured amount of distilled water, approximately 1000 cc.
3. Heat beaker at a controlled temperature of 100° F (± 3° F). Maintain for 4 hours. Do not heat on a hot plate. Heat either in an oven or with an immersion heater so that the water will remain clear for tests.
4. Run a blank on distilled water.
5. Decant water and analyze for soluble ions. Test only for salts in leached water used in the test.

For corrosion protection, the entire length of the anchor shall be encased in a polypropylene (or polyethylene) tube grouted both inside and outside at the same time. The tube within the bond length shall be corrugated.

If the bond length is grouted and the anchor stressed before grouting the stressing length, the Contractor must provide a mean to ensure that the grout covers the entire bond length plus two feet of the stressing length.

Provide spacers to center the strands inside the polypropylene tube and centralizers to center the polypropylene tube in the hole, both in the stressing and in the bond portion. These centralizers shall be provided at a maximum of five-foot intervals throughout the bond length of the anchor in the stressing length, so that no less than 0.5 inches of grout cover is achieved surrounding the anchor.

Place spacers at five foot and ten foot intervals throughout the tendon length to ensure grout cover on all elements. Centralizers and spacers may be made of any material, except wood, not deleterious to the prestressing steel or plastic sheath. Spacers and centralizers must be approved by the Engineer prior to use.

The entire polypropylene (or polyethylene) tube, together with any trumpet used under the anchor head, including all joints, shall be water and mortar tight. Provide seals, gaskets and the like as required.

The tendons, the anchor head, and any other metallic parts of the anchor, shall be electrically insulated from piles and wales, to the Engineer's satisfaction.

628.4-INSTALLATION:

628.4.1-General: Anchor centerlines shall not deviate from their planned location by more than 3 degrees, nor shall they approach each other closer than 4 feet at their lower ends.

A resistance factored unit bond stress and a set of estimated required bonded lengths and corresponding grouted diameters are specified on the plan. Should the Contractor decide to use a different factored unit bond stress, he shall be responsible for determining the bond length necessary to develop adequate load capacity to satisfy anchor testing acceptance criteria for the design load. Any rock anchor that does not meet the test acceptance criteria shall be replaced at no additional cost to the department.

The diameter of the drilled hole shall be adequate for grouting inside and outside the polypropylene tube. The hole shall be free of fall-in soil or other debris immediately prior to grouting.

628.4.2-Hole in the Stressing Length: Casing of portions of many or all holes may be needed to maintain an open clean hole. There will be no additional compensation for such casings; their cost shall be included in the bid prices.

628.4.3-Hole in the Bond Length: Drilling Logs shall be prepared in a manner approved by the Engineer, and submitted daily. They shall contain the following information:

1. Characteristics of all materials encountered during the drilling process, and their specific location(s) within the holes
2. Length of each run with percentage of core recovery
3. The location of special features such as mud seams, open cracks, broken rock, etc.
4. Points where abnormal loss or gain to drill water has occurred
5. Groundwater levels or other items of interest for grouting
6. All significant actions of the bit
7. If any weak material, such as coal, clay, weathered rock or the like is encountered within the required bond length, the hole shall be extended to compensate for the weak material.
8. If large voids are encountered, consolidation grouting and re-drilling of the hole will be required. The grout shall be injected at the lowest point of the drill hole and shall proceed such that the hole is filled progressively from the bottom to the top, in order to prevent air voids.

Consolidation grout should have a water/cement ratio of between 0.45 and 0.55. Variations from these ratios shall require an approval from the Engineer prior to the placement. Special measures (such as stiff grout mixes) may be required to prevent or reduce grout loss. A consolidation-grouted hole shall not be re-drilled until the grout has had a minimum of 24 hours to set up.

628.4.4-Grouting: During grouting, the end of the grout pipe shall be covered by at least 2 feet of wet grout. Grouting shall proceed from the bottom up, to prevent air voids. The grout in the stressing length must not interfere with the stressing operation; tendons in the stressing length must not develop any bond to the surrounding grout. To achieve this, the grout inside the polypropylene tube shall preferably be placed after stressing.

The grout shall be placed over the entire bond length without interruption. The anchor shall then remain undisturbed until the grout has reached strength of 3500 psi. The following data shall be recorded and submitted to the Engineer, about the grouting operation, on a daily basis:

1. Type of Mixer
2. Type of Cement and Water/Cement Ratio
3. Type of Additives (if approved)
4. Grout Pressure
5. Test Sample Strengths (prior to stressing)
6. Volume of Grout placed in the Bond and in the Stressing Lengths

628.4.5-Corrosion Protection of Anchorage: Following acceptance of the anchor by the Engineer, the portion of each tendon extending past the lock-off plate shall be cut off with Carborundum blades in a manner that will not develop excessive heat. The tendon anchorage shall not be damaged by the cutting operation. All stressing anchorages shall be encased in concrete at least 4 inches or as shown on the plan.

The trumpet shall be sealed by bearing plate and shall overlap the unbonded length corrosion protection by at least 6 inches. The trumpet shall be long enough to accommodate movement of the structure and the tendon during testing and stressing. The trumpet shall also be long enough to enable the tendon to make a transition from the diameter of the tendon along the unbonded length to the diameter of the tendon at the wedge plate without damaging the encapsulation.

The trumpet shall be completely filled with grout, which must be placed after the ground anchor has been tested and stressed to the lock-off load. The trumpet shall either have a temporary seal between the trumpet and the unbonded length corrosion protection or shall fit tightly over the unbonded length corrosion protection for a minimum of 6 inches.

628.5-ANCHOR TESTS:

In the following sections, AL denotes alignment load (0.10P) and P denotes the anchor design load.

628.5.1-Performance Test: A performance test shall be carried out on the first anchor stressed for each tieback group shown on the plans and on one additional anchor selected by the Engineer. During the performance test, the contractor shall incrementally load and unload the anchor in accordance with the following schedule. The movement of the tendon shall be recorded to the nearest 0.001 inches at each increment, with respect to an independent (fixed) reference point. The load applied by the jack shall be monitored with a pressure gauge and preferably a load cell.

Each load shall be held for a minimum of one minute with the maximum loading being held for 60 minutes.

All leaks in the jacking system shall be repaired as discovered and the test restarted at the initial reading.

Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
AL	AL	AL	AL	AL	AL
0.25 P	0.25 P	0.25 P	0.25 P	0.25 P	0.25 P
	0.50 P	0.50 P	0.50 P	0.50 P	0.50 P
	0.25 P	0.75 P	0.75 P	0.75 P	0.75 P
		0.50 P	1.00 P	1.00 P	1.00 P
		0.25 P	0.75 P	1.20 P	1.20 P
			0.50 P	1.00 P	1.33 P (Max)
			0.25 P	0.75 P	- Hold for creep test
				0.50 P	- Reduce for lock-off load, P
				0.25 P	

All anchors undergoing performance tests shall hold the maximum load, i.e. 1.33P, for 10 minutes (or 60 minutes). The jack shall be repumped as necessary in order to maintain a constant load. During this period, the anchor movement with respect to a fixed reference point shall be recorded at 0 seconds, 30 seconds, 1 minute, 2, 3, 4, 5, 6, and 10 minutes (and 15, 20, 25, 30, 45, and 60 minutes). The dial gauge used for monitoring movement shall be capable of reading the entire movement without resetting. Upon passing the acceptance criteria in 628.5.4, the anchor shall be adjusted to lock-off load, P.

628.5.2-Lift-Off Test: A lift-off test shall be part of the performance test. After transferring the load to the end anchorage, a lift-off reading shall be made. The load determined from the lift-off reading shall be within 5 percent of the desired transfer or lock-off load otherwise the end anchorage shall be reset to the design load and another lift-off reading shall be made.

Lift-off tests can be made a minimum of 24 hours, and a maximum of 7 days, after the design load has been locked-off in the anchor. The results of the test shall be submitted to the Engineer on the day of the test. All tendons which are to be lift tested must have an adequate length of tendon left protruding over the anchorage to permit jacking. The jack utilized for lift-off testing shall be calibrated within two weeks of testing and at intervals of approximately 3 months throughout testing. The contractor shall furnish the calibration chart and submit it to the Engineer.

628.5.3-Proof Test: All anchors not performance tested shall be proof tested by incrementally loading the anchor in accordance with the following schedule. Load and movement shall be monitored as stated in 628.5.1.

Load
AL
0.25 P
0.50 P
0.75 P
1.00 P
1.20 P
1.33 P (Max)
- Hold for creep test
- Reduce to lock-off load, P

The proof test results shall be compared to the performance test results. Any significant variation from the performance test results may require a performance test on the next anchor. Lift-off tests for proof tested anchors may be required as designated by the Engineer. The Contractor shall do all additional tests due to inadequate results of a proof test at no cost to the department.

Upon passing the acceptance criteria in 628.5.4, the anchor shall be adjusted to lock-off load, P.

628.5.4-Acceptance Criteria: A performance-tested or proof-tested rock anchor with a 10-minute load hold shall be accepted if (1) the rock anchor resists the maximum test load with less than 0.04" of movement between 1 minute and 10 minutes; and (2) the total elastic movement at maximum test load exceeds 80% of the theoretical elastic elongation of the unbonded length; or (3) the total elastic movement at the maximum test load does not exceed the theoretical elastic elongation of the unbonded length plus 50% of the theoretical elongation of the bonded length.

A performance-tested or proof-tested rock anchor with a 60-minute load hold shall be accepted if (1) the rock anchor resists the maximum test load with a creep rate that does not exceed 0.08" in the last log cycle of time; and (2) the total elastic movement at maximum test load exceeds 80% of the theoretical elastic elongation of the unbonded length.

The initial lift-off reading shall be within +5% of the design lock-off load. If this criterion is not met, the tendon load shall be adjusted accordingly and the initial lift-off reading repeated.

If any anchor fails to meet the acceptance criteria, the Contractor shall determine, if possible, the reason for failure. An additional anchor shall be installed in accordance with this specification at a location approved by the Engineer and tested to verify that the capacity of the new anchor meets the 1.33 P load. The Department will make no payment for failed anchor. An additional anchor in this area shall be performance tested when a failure occurs, at no cost to the Department.

Records shall be kept of the load and elongation for each increment of loading for each tieback and shall be furnished to the Engineer following the completion of each test.

628.6-METHOD OF MEASUREMENT:

628.6.1-Rock Anchors, Installed, per each: The work performed for rock anchor installation shall be included in this item. The quantity of work performed to install the rock

anchors as described above and to the depth shown on the plans will be paid for at the contract unit price bid for this item below. This price and payment shall include furnishing all material required for installation of the anchor, grouting of the anchor as specified or required, proof testing of all anchors, covering of anchor heads, and replacing failed anchors.

628.6.2-Rock Anchor Performance Test, per each: This item covers the cost of a performance test, over and above that of the proof test. (Cost of proof test is included in the item, "Rock Anchors, Installed").

628.6.3-Additional Anchor Length, per foot: This item will be applicable if the actual elevation of sound rock is, on the average, lower than that indicated on the Plans, and if weak materials are encountered in the sound rock, as described under 628.4.3 above. The measurement will be based on the anchor slope shown on the Plans.

This item shall be exercised after the installation of soldier piles but prior to the fabrication of tiebacks. The anchor stressing lengths shall be reevaluated and adjusted if needed by the Engineer based on top of sound rock information obtained during soldier pile installation. The reevaluated anchor stressing lengths will be compared to the Contractor's bid quantity to determine the quantity for this bid item.

628.6.4-Drilled Hole, 4" Diameter, per linear foot: This item will occur if large voids are encountered in the sound rock as described under 628.4.3 above. The hole diameter of 4" coincides with item, "Additional Anchor Length", and the anchor specifications used under item "Rock Anchors, Installed". The required length of re-drilling will be measured, based on the anchor slope shown on the Plans.

628.6.5-Pressure Injected Grout, per cubic foot: This item will be applicable if large voids are encountered in the sound rock as described under 628.4.3 above. Measurement will be based on the actual cubic foot amount of cement used in the grout that is injected in the void.

628.7-BASIS OF PAYMENT:

The quantities, determined as provided above, will be paid for at the contract unit prices bid for the items below, which prices and payments shall be full compensation for furnishing all materials and doing all the work in a workmanlike and acceptable manner, including all tools, equipment, supplies, labor and incidentals necessary to complete the job.

628.8-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
628007-001	Rock Anchors, Installed	Each
628007-002	Rock Anchor Performance Test	Each
628007-003	Additional Anchor Length	Linear Foot
628001-001	Drilled Hole, 4" Diameter	Linear Foot
628002-001	Pressure Injected Grout	Cubic Foot

~~July 8, 2019~~ August 2, 2019

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 639
CONSTRUCTION SURVEYING

639.5-BASIS OF PAYMENT:

ADD THE FOLLOWING AS PARAGRAPH TWO:

Payment shall be per lump sum on a monthly basis at partial payments equal to months of contract time remaining.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 679
OVERLAYING OF PORTLAND CEMENT

679.3-CONSTRUCTION METHODS:

679.3.1-Removal of Existing Deck Surface:

679.3.1.1-Removal of Existing Deck Surface Phase I:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

The Contractor shall determine the depth to the top mat of reinforcing steel using methods acceptable to the Engineer. The existing deck shall be removed ~~down~~ so as to expose the topmost components of rebar in the upper mat of ~~rebar~~ reinforcement. Full exposure of the upper mat of reinforcement is not required. The deck removal shall be accomplished by roto-milling, hydrodemolishing, or any means acceptable to the Engineer. ~~When full depth removal of material is necessary, the forming shall be incidental to the cost of the concrete deck overlay.~~

After removal to the ~~top mat of reinforcing steel~~ deck is complete as described above, the Contractor shall sound the deck using chain drags and delineate remaining areas of delaminated and unsound concrete for removal subject to the approval of the Engineer. Aerosol spray paint for delineating shall be provided by the Contractor. Edges around these concrete removal areas shall be vertical or slightly undercut. Upon completion of removal, the Contractor shall provide a hydrodemolished surface on which to install the new concrete Overlay.

When full depth removal of material is necessary, the forming shall be performed in accordance with Sections 104.3 and 109.4 of the Specifications.

679.7-BASIS OF PAYMENT:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

The quantities, determined as provided above, will be paid for at the contract unit price bid for the items listed below. The price and payment shall be full compensation for all material

removal and for furnishing and placing all the materials and doing all the work herein prescribed in an acceptable manner including all materials~~, and doing all the work herein prescribed in an acceptable manner including all~~ labor, tools, equipment, supplies and incidentals necessary to complete the work.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

ADD SECTION 900 AND FOLLOWING CONTENTS:

SECTION 900
SITE FURNISHINGS, TEMPORARY RAILROAD CROSSING

900.1-DESCRIPTION:

This work consists of the design, construction, maintenance, rail traffic coordination and removal of a Temporary Railroad Crossing for construction access. All construction methods, materials, workmanship and equipment to conform to the applicable sections of:

AREMA 2015 Manual for Railway Engineering

900.2-MATERIALS:

Aggregate Material - per WVDOT Specifications Section 704.6

Geotextile - per AREMA 2015 "Manual for Railway Engineering", Non-Woven, 12-16 oz/SY

Ties - per AREMA 2015 "Manual for Railway Engineering", Chapter 30. Ties shall be 7" x 9" x 10'-0", Grade 5

900.3-CONSTRUCTION:

Place Geotextile material on all exposed earth surfaces within the Temporary Railroad Crossing area. Aggregate and/or Ties to be placed over Geotextile material to protect rail and crossing. Installation shall not interfere with the operation of the Railroad Company main line. No earthen excavation anticipated for this item.

900.4-METHOD OF MEASUREMENT:

This item will be paid as Each, complete in place, which price shall be full compensation for furnishing, placing, removal, all personnel, equipment, materials and all incidentals.

900.5-PAY ITEM:

ITEM	DESCRIPTION	UNIT
900020-001	Site Furnishings, Temporary Railroad Crossing	Each

~~March 2, 2012~~ August 13, 2019

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

SUBCONTRACTOR PROMPT PAYMENT

1-GENERAL:

~~Contractors shall pay subcontractors for work satisfactorily performed by the subcontractor within fourteen (14) calendar days of the Contractor's receipt of Division of Highways (Division) payment for subcontracted work.~~ Prime contractors shall pay subcontractors for work satisfactorily performed by the subcontractor within fourteen (14) calendar days of the Contractor's receipt of the Division of Highways ("Division") payment for subcontracted work. If the prime contractor elects to withhold retainage from the subcontractors, the prime contractor shall release all retainage owed to the subcontractor for satisfactory completion of the accepted work within twenty-one (21) calendar days after the Division pays the prime contractor (which could be the portion that is included in the prime's payment). Prime contractors are not permitted to withhold retainage from subcontractors until the project's final payment. Acceptance of the subcontracted work by the Division shall constitute satisfactory completion of subcontracted work. Failure and penalties for noncompliance are detailed in Section 3 below.

2-WITHHOLDING PAYMENT RESTRICTIONS:

The contractor may delay or postpone payment to a subcontractor for good cause. This may include, but shall not be limited to, failure by the subcontractor to pay for labor, supplies, or materials, or to provide any required documentation. Prior to any delay or postponement of payment, the Contractor shall provide written documentation to the Division for Approval. The Contractor shall also provide written notification of any such good cause to the affected subcontractor at the same time it is submitted to the Division for approval. Only after written approval of the Division's acceptance of the Contractor's good cause, shall the Contractor be allowed to postpone or delay any payment.

If the subcontractor does not receive payment within the required 14 days, the subcontractor shall give written notice of nonpayment to the Engineer.

The notice shall:

a) State the name of the Prime Contractor, the -Project Number, and the Estimate Number., and the quantity in dispute.
b) Provide an itemized summary on which the quantity t is based; and
c) Any additional information that may be relevant to the dispute concerning payment by the Contractor

3-PENALTIES FOR NONCOMPLIANCE:

Unless otherwise provided for by Section 2 above, the Contractor shall provide the Division proof of payment for subcontracted work on the West Virginia Department of Transportation Certification of Subcontract Payments form attached at the end of this provision separately for each Subcontractor. This documentation will be provided to the Division within two Estimates of the Progress Estimate in which there is subcontracted work performed and accepted by the Division.

Failure by the Contractor to produce documentation of prompt payment within the duration listed above may result in the suspension of the third and any future progress estimates for payment to a Contractor by the Division until the Contractor can demonstrate that the issues preventing submission of documentation has been resolved and that prompt payment for subcontracted work will be maintained throughout the remaining life of the Contract.

In addition to the above, continued failure to promptly pay subcontractors may result in disqualification of a contractor as non-responsible, refusal by the Division to issue a Proposal Form to a contract for future projects as provided in subsection 102.3, or such other penalty as the Division determines is appropriate. All subcontracting agreements made by the contractor as provided in subsection 108.1 shall include this special provision as incorporated in the contract.

4-RESOLUTION OF DISPUTES:

When the steps from step two above result in a dispute between the Contractor and subcontractor the procedure for resolving the dispute is as follows:

The Division will verbally contact the Contractor within 48 hours to ascertain whether the amount withheld is an undisputed amount.

If the Division determines that a part or all of the amount withheld is an undisputed amount, the Division will instruct the Contractor to pay the subcontractor the undisputed amount within three days. The instructions will be confirmed in writing.

The Division will verbally communicate to the subcontractor the results of the discussion with the Contractor and confirm the results in writing.

If the Contractor fails to pay the subcontractor the undisputed amount with the specified three days, the subcontractor may report the nonpayment in writing to the Division.

Upon receipt of notification of nonpayment from the subcontractor, the Division will schedule a meeting to verify and discuss the nonpayment issue. This meeting will be held at the Division Office no later than 10 days after receiving notice from the subcontractor.

Invited to this meeting will be the Contractor, the subcontractor, the District Construction Engineer, FHWA Area Person, DOH Regional Construction Engineer, and the Engineer. The purpose of this meeting will be to establish why payment was not made to the subcontractor in the required time period. If it is determined that the Contractor is delinquent in payment to the subcontractor, further progress payments to the Contractor may be withheld until the subcontractor is paid.

4.1-Legal Relations and Progress: If payment is not made to the subcontractor within seven days after the Division determines that the Contractor is delinquent in paying the subcontractor and the next progress payment becomes due, the progress payment will not be processed and a second meeting will be held at the District Office to address the dispute. The second meeting will be held not later than five days after the close of the seven day period. If the results of this second meeting reveal that payment to the subcontractor continues to be

delinquent, the Division may order a suspension of work based upon the failure of the Contractor to carry out the provisions of the Contract or he may allow work to continue and withhold future progress payments as stated above.

The Contractor shall notify the Engineer when payment has been made to the subcontractor. The Engineer will verify the payment with the subcontractor to ensure payment was received.

Nothing in this provision will prevent the subcontractor from pursuing a claim with the surety under the Contractor's payment bond at any time.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
CERTIFICATION OF SUBCONTRACT PAYMENTS

Federal Project No.: _____ Prime Contractor: _____ Payment No. _____

State Project No.: _____ Subcontractor: _____ Estimate No. _____

Tier Subcontractor: _____

This payment is a: ☐ Partial Payment ☐ Final Payment

The undersigned Prime Contractor herby certifies that payment was made as detailed below: (Attach more sheets, if necessary)

Bid Item No.	Bid Item	Item Unit		Quantity Accepted and Paid – This Estimate	Previous Est.	Total to Date
			TOTALS			

☐ Approved Contract Adjustments (qnty) _____.

This certification is made under Federal and State laws concerning false statement. Supporting documentation for this payment is subject to audit and should be retained for a minimum of three (3) years from project acceptance date. In the event the subcontractor was not paid in accordance with affidavits submitted by the Prime Contractor, all documentation supporting the contractor's position should be submitted.

I declare under penalty of perjury, and any other applicable state or federal laws, that the statements made on this document are true and complete to the best of my knowledge, and that all subcontractors have been paid within fourteen (14) days after receiving payment for the work performed as described above.

Prime Contractor Date Witness Signature Date

The undersigned subcontractor for the above named project hereby certifies that payments were received and/or justification by contractor is correct

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 102
BIDDING REQUIREMENTS AND CONDITIONS

102.7-IRREGULAR PROPOSALS:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

Proposals will be considered irregular and will be rejected for any of the following reasons:

i. When the Proposal is on a form other than that furnished by the Division or if the form is altered. Use of a Division approved computer generated Schedule of Items shall not be considered an alteration of form or format within the meaning of these Specifications.

ii. When there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the Proposal incomplete, indefinite, or ambiguous as to its meaning. Also, when Division approved computer generated Schedule of Items show any alteration of format, additions or amendments not called for, errors or omissions in units of measure, or erasures.

iii. When the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a Contract pursuant to an award. This does not exclude a bid limiting the maximum gross amount of awards acceptable to any one bidder at any one bid letting, providing that any selection of awards will be made by the Division.

iv. Failure to sign or properly execute the Proposal.

v. Failure to indicate a proposed goal in Section C, Item 3 of the Notice contained in the Proposal, when a Division determined goal is indicated in paragraph 5 of the Special Provision for Disadvantaged Business Enterprise Utilization.

vi. Failure to properly acknowledge receipt of amendment(s) in accordance with Section J of the notice contained in the proposal.

vii. Failure to show the West Virginia Contractor's License Number when required in Section H of the notice contained in the proposal.

viii. The proposal is mathematically and materially unbalanced. A mathematically unbalanced bid contains lump sum or unit price items that do not include reasonable labor, equipment, and material costs plus a reasonable proportionate share of the Bidder's overhead costs, other indirect costs and anticipated profit. A Materially Unbalanced Bid is when the Agency determines that an award to the Bidder submitting a Mathematically Unbalanced Bid will not result in the lowest ultimate cost to the Agency.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 207
EXCAVATION AND EMBANKMENT

207.1-DESCRIPTION:

ADD THE FOLLOWING:

Remove, Store and Place Material, Natural Streambed Material. This work shall consist of the removal of natural streambed material from existing streams that will be relocated in the project area, temporarily storing this material, and placement of this material in the enhanced stream channels.

207.2-MATERIALS:

ADD THE FOLLOWING:

207.2.3-Streambed Material: Top 6 inches of natural streambed material consisting of cobble, gravel, pebble, sand and/or silt materials.

CONSTRUCTION METHODS

207.5-DITCHES:

ADD THE FOLLOWING:

Remove top 6 inches of natural streambed material from stream channels, as directed. After construction of the enhanced stream channel, place stockpiled natural streambed material in a uniform layer of 6 inches of depth, or as directed.

207.17-PAY ITEMS:

ADD THE FOLLOWING:

ITEM	DESCRIPTION	UNIT
207015-001	Remove, Store and Place Material, Natural Streambed Material	Square Yard

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 405
CHIP SEALS

405.14-TESTING AND ACCEPTANCE:

405.14.2-Acceptance Testing:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

Acceptance sampling and testing is the responsibility of the Division. Acceptance for aggregate will be based on the uniformity of the aggregate and the dust content. ~~Samples shall be taken according to ASTM D5624.~~ Samples shall be taken from the conveyor belt on the chip spreader in accordance with MP 700.00.06 or from the roadway in accordance with ASTM D5624. Samples may be split with the contractor. Sampling frequency shall be one sample for every lane mile per layer. This sample shall be the lot. Fractions of a mile less than 0.5 will be included in the previous lot, and fractions of a mile greater than 0.5 will be a separate lot.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 420
SINGLE / MULTIPLE COURSE MICRO SURFACING

420.2-MATERIALS:

DELETE THE CONTENTS ADD REPLACE WITH THE FOLLOWING:

Furnish a Micro Surfacing mixture consisting of a properly designed and proportioned blend of polymerized asphalt emulsion, fine aggregate, Portland cement, water and other additives. All materials must be from a WVDOT approved source. Use materials meeting the following:

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 501
PORTLANT CEMENT CONCRETE PAVEMENT

501.3–PROPORTIONING:

DELETE TABLES 501.3.1 AND REPLACE WITH THE FOLLOWING:

TABLE 501.3.1 {ENGLISH}

Minimum 28-Day Design Strength	Minimum Cement Factor	Maximum Water Content	Standard Size of Coarse Aggregate	Target Entrained Air
~~psi~~ Pounds per square inch	~~Bags per cu. yd.~~ lbs./c.y.	~~Gal. per cu. yd. of concrete~~ lb. of water / lb. of cement	Number	Percent
3,000 Compressive or 500 Flexural*	~~6~~ 564**	~~33~~ 0.44	357, 467 57 or 67	7

TABLE 501.3.1 {METRIC}

Minimum 28-Day Design Strength	Minimum Cement Factor	Maximum Water Content	Standard Size of Coarse Aggregate	Target Entrained Air
Mpa	~~kg per cu. Meter~~ kg/c.m.	~~Liters per cu. m. of concrete~~ L of water / kg of cement	Number	Percent
20.7 Compressive or 3.5 Flexural*	335 ~~kg~~**	~~163.4~~ 0.44	357, 467 57 or 67	7

* Flexural strength when tested by the third point method.

** An equal volume of a ~~Pozzolanic additive~~ SCM may be substituted for portland cement up to the following maximum amount. Only one ~~Pozzolanic additive~~ SCM is permitted in a mix design.

MATERIAL	QUANTITY
Fly Ash	~~1 bag~~ 20%
Ground Granulated Blast Furnace Slag	~~3 bags~~ 50%
Microsilica	~~1/2 bag~~ 8%

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 501
PORTLAND CEMENT CONCRETE PAVEMENT

501.5-EQUIPMENT:

501.5.3-Mixers and Hauling Equipment:

501.5.3.4-Nonagitator Trucks:

DELETE THE CONTENTS OF SUBSECTION 501.4.3.4 AND REPLACE WITH THE FOLLOWING:

Bodies of nonagitating hauling equipment for concrete shall be smooth, mortar tight, metal ~~(non-aluminum)~~ containers and shall be capable of discharging the concrete at a satisfactorily controlled rate without segregation. The concrete shall be discharged from the bottom of the container. If discharge of concrete is accomplished by tilting the body, the surface of the load shall be retarded by a suitable baffle. Covers shall be provided when needed for protection.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 501
PORTLAND CEMENT CONCRETE PAVEMENT

501.12-FINAL STRIKE-OFF, CONSOLIDATION AND FINISHING:

501.12.7-Final Finish:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

Use a burlap drag or other method approved by the Engineer, which spans the entire width of pavement being placed, as soon as all excess moisture has disappeared and while the concrete is still plastic enough to make a granular surface possible. Drag the burlap longitudinally along the pavement surface after finishing to enhance the pavement texture. Clean or replace the drag material as necessary to prevent it from getting plugged with grout. Measures should be taken to produce a surface of uniform appearance that is free from deep striations.

Following the dragging operation, the surface of the mainline pavement, acceleration and deceleration lanes, ramps, and all travelled ways shall be given a final tined groove finish. This grooved finish shall be a longitudinally tined texture, parallel to the pavement centerline. A 3 ± ½ inch wide strip of pavement surface shall be protected from tining for the length of and centered about the longitudinal joint(s). The longitudinal tining shall extend to within 6 inches of the outside edge of the pavement.

The equipment used for longitudinal tining shall have automated horizontal and vertical controls to ensure straight, uniform depth tined grooves. It shall be mounted on a device which is driven by tracks (wheel-driven equipment will not be permitted) and shall be controlled by the same grade alignment method as the concrete paver. The tool used for tining shall have a single row of tines and shall produce a groove that is 1/8 in. wide (3 mm) and 1/8 to ¼ in. (3-6 mm) deep. The grooves shall be spaced uniformly apart at a center to center distance of ¾ in. (20 mm). Tining shall be performed when the concrete surface is of such plasticity as to prevent excessive raveling (concrete too dry) or to prevent mortar from flowing back into the grooves (concrete too wet). All tining shall be accomplished with a single pass of the tool. Tines should be cleaned and replaced as necessary.

Transverse tining shall be permitted in areas requiring hand finishing and consolidation, including shoulders, as required in Section 501.12.4.

Septe[illegible]mbe[illegible] 2019

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 601
STRUCTURAL CONCRETE

601.3–PROPORTIONING:

601.3.1-Mix Design Requirements:

REPLACE THE 6th LINE IN TABLES 601.3.1A {ENGLISH} AND {METRIC} WITH THE FOLLOWING:

TABLE 601.3.1A {ENGLISH}

Class of concrete	Design 28 Day Compressive Strength	Target Cement Factor	Maximum Water Content	Standard Size of Coarse Aggregate****	Entrained Air
	Pounds per square inch	lbs./c.y. *	lb. of water / lb. of cement **	Number	Percent
H	4000	~~658~~ See Table 601.3.1C	0.40	57, 67	6 ½

TABLE 601.3.1A {METRIC}

Class of concrete	Design 28 Day Compressive Strength	Target Cement Factor	Maximum Water Content	Standard Size of Coarse Aggregate****	Entrained Air
	Mpa	~~Kg per cu. m~~. kg/c.m.*	~~L/Kg~~ L of water / kg of cement **	Number	Percent
H	28	~~390~~ See Table 601.3.1C	0.40	57, 67	6 ½

DELETE FOOTNOTES * and ** FROM TABLE 601.3.1A AND REPLACE WITH THE FOLLOWING:

* An equal ~~volume~~ mass of a SCM may be substituted for Portland cement up to the maximum amount in Table 601.3.1B. Only one SCM is permitted in a mix design, except for Class H concrete. The target cement factor of Class H concrete shall consist of Option 1 or Option 2 from Table 601.3.1C. The Contractor may choose either option.

** When using a SCM, ~~volumes~~ masses of these materials shall be considered as cement for purposes of establishing maximum water content.

DELETE TABLE 601.3.1B AND TABLE 601.3.1C AND REPLACE WITH THE FOLLOWING:

TABLE 601.3.1B

Material	Class of Concrete	Quantity
Fly Ash	All Classes Except H ~~B, C, D~~	20% ~~0.48 ft3 (0.014 m3)~~
	~~A, K~~	~~0.60 ft3 (0.017 m3)~~
	~~DC~~	~~0.72 ft3 (0.020 m3)~~
Slag Cement	All Classes Except H ~~A, B, K~~	50% ~~1.43 ft3 (0.040 m3)~~
	~~C, D~~	~~0.96 ft3 (0.027 m3)~~
	~~DC~~	~~1.79 ft3 (0.051 m3)~~
Silica Fume	All Classes Except H	8% ~~0.24 ft3 (0.007 m3)~~

TABLE 601.3.1C

Option	Cement	Fly Ash	Slag Cement	Silica Fume
1	470 lbs. (213 kg) ~~2.39 ft3 (0.068 m3)~~	132 lbs. (60 kg) ~~0.84 ft3 (0.024 m3)~~		30 lbs. (13.6 kg)
2	423 lbs. (192 kg) ~~2.15 ft3 (0.061 m3)~~		195 lbs. (88 kg) ~~1.08 ft3 (0.031 m3)~~	30 lbs. (13.6 kg)

September 4, 2019

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 615
STEEL STRUCTURES

615.6-ERECTION:

615.6.9-Final Cleaning of Weathering Steel Bridges:

DELETE THE SECOND PARAGRAPH AND REPLACE WITH THE FOLLOWING:

Cleaning may be by high pressure water, powered or hand wire brushing, or by Brush off Blast Cleaning according to SSPC-SP 7/ NACE 4. Cleaning shall be followed by a clean water rinse to remove all residues of detergents and cleaners if they were used. All grease and oil shall be removed prior to the clean water rinse by solvent cleaning.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 615
STEEL STRUCTURES

615.1–GENERAL:

615.1.1-Description:

ADD THE FOLLOWING:

615.1.2-Pack Rust Repair: This work shall consist of furnishing all labor, materials and equipment necessary to repair built-up steel members that have been deformed by pack rust in accordance with these specifications and as detailed at locations indicated on the plans.

615.1.2.1-Submittals: Submittals shall be accepted by the Engineer prior to commencement of the subject work.

Contractor shall provide procedure for the removal of pack rust and proposed quality control procedure for pack rust removal and inspection.

615.3–MATERIALS:

ADD THE FOLLOWING:

615.3.8-Penetrating Sealer: The Epoxy Penetrating Sealer shall be compatible with proposed paint system specified in the project documentation and shall be confirmed by written recommendation of the paint manufacturer.

615.3.9-Temperature Sticks: The Temperature sticks shall meet the requirements of AASHTO / American Welding Society (AWS) D1.5:2010, Bridge welding code and shall be utilized for monitoring the steel temperatures.

615.5-ASSEMBLY:

ADD THE FOLLOWING:

615.5.8: All craftsmen and laborers will be required to complete a non-production test run demonstrating their ability to perform pack rust removal in accordance with this special provision to the satisfaction of the Engineer prior to work. The non-production test run will be performed on a section determined by the Engineer.

The Engineer will identify the locations and limits which will include all areas shown on the plans and may include other locations where built-up steel plates sections require repair.

Abrasive Blast the areas identified for pack rust removal in accordance with Section 688.2.2.2 and 688.2.2.2.3.

Heat the areas to be treated to a maximum of 800 degrees Fahrenheit using an oxygen-acetylene or propane torch with a rosebud tip capable of directing localized heat to the specified maximum temperature. Moderate the application of heat to avoid annealing the steel or otherwise changing its properties by only heating short sections at a time. Do not perform heating operation without the Engineer present to monitor temperatures. Do not heat more than four adjacent pockets of pack rust at one time. Maintain a temperature of 800 degrees Fahrenheit for the duration of the procedure.

After the target temperature has been achieved, provide a 3/8-inch-thick buffer plate fabricated to the size necessary to completely cover the rust pockets between rivets/bolts. Ensure that the buffer plate has a handle that is securely attached. Use AASHTO M270 Grade 36 or similar mild steel to fabricate the plate and handle. Place the buffer plate directly against the heated area to be treated to avoid scarring and case hardening of the steel member from the rivet hammer. Do not heat the buffer plate.

Use a pneumatic rivet hammer capable of a minimum 900 blows per minute. Strike the buffer plate with the rivet hammer until the pack rust has been driven out of the seam. Use hand and mechanical tools to remove remaining pack rust.

615.5.9-Paint Application: Apply the penetrating sealer per the manufacturer's recommendations. Clean and paint the repaired areas in accordance with project documents.

615.7-MEASUREMENT AND PAYMENT:

ADD THE FOLLOWING:

The quantity of pack rust removal to be paid for will be the number of linear foot complete and accepted.

615.8-BASIS OF PAYMENT:

ADD THE FOLLOWING:

Basis of payment for "Pack Rust Removal" shall be paid for at the contract unit price per linear foot. The cost for the items listed below, which price and payment shall be full

compensation for furnishing all the materials and doing all the work herein prescribed in workmanlike and acceptable manner, including all labor, tools, equipment, supplies and incidentals necessary to complete the work.

615.9-PAY ITEMS:

ADD THE FOLLOWING:

ITEM	DESCRIPTION	UNIT
615075-003	Miscellaneous Bridge Work, Pack Rust Removal	Linear Foot

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 625
DRILLED CAISSON FOUNDATIONS

625.2-TESTS AND SUBMITTALS:

625.2.6-Nondestructive Testing:

625.2.6.1-General Requirements:

DELETE PARAGRAPHS TWO AND THREE AND REPLACE WITH THE FOLLOWING PARAGRAPHS:

The CSL tests shall be conducted by the Division in conformance with ASTM D6760 and shall be certified (signed and sealed by a Professional Engineer licensed in West Virginia). The CSL tests shall be performed by a testing company approved by MCS&T Division.

The Contractor shall comply with the scheduling and notification requirements for caisson construction outlined in Section 625.2.3 by contacting the following MCS&T Division e-mail address: DOHMCSnTcaisson@wv.gov. This will allow MCS&T Division to provide a qualified company to perform testing within the time frames allotted for in paragraph one of this subsection.

625.2.6.3-CSL Logging Procedures:

DELETE PARAGRAPH TWO

625.2.6.5-Evaluation of CSL Test Results:

DELETE THE FIRST SENTENCE OF PARAGRAPH ONE.

ADD THE FOLLOWING AFTER THE FIRST PARAGRAPH:

Criteria to be used for acceptance or rejection of drilled caisson using CSL testing:

The rating of the drilled caisson integrity will consider the increases in first arrival time (FAT) and the energy reduction relative to the FAT or energy in a nearby zone of good concrete. The criteria for rating the concrete from the CSL test is below:

Rating	Criteria
Good (G)	FAT increases 0-10% and energy reduction < 6 db
Questionable (Q)	FAT increases 11-20% and energy reduction < 9 db
Poor / Flaw (P/F)	FAT increases 21 to 30% or energy reduction of 9 to 12 db
Poor / Defect (P/D)	FAT increases 31% or more or energy reduction >12 db

Flaw or defect zones as indicated in the rating table above will be indicated on the logs and listed in a table within the report. The flaw or defect zones and their horizontal and vertical extent will be discussed in the report text. Flaws must be addressed if they affect more than 50% of the tested tube pairs at the same depth. Defects will be addressed if they affect two or more of the tested tube pairs at the same depth. At a minimum, addressing flaws and defects will include Crosshole Tomography (CT). If it is determined that the rating is less than Questionable, based on the results of the CSL testing, the Division can require core drilling and sampling by the Contractor for further evaluation of the flaw or defect. The diameter, number, depth, and location of cores shall be as directed by the Engineer.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 636
MAINTAINING TRAFFIC

636.9-TRAFFIC CONTROL DEVICES:

Traffic control devices for work areas include, but may not be limited to, signs, barricades, drums, cones, channelizer cones, delineators, and flashers. They shall be installed in accordance with standards detailed in the manual "*Manual on Temporary Traffic Control for Streets and Highways*", latest version, published by the Division, or as shown on the plans.

If the Total Contact Bid Amount is over $500,000 or otherwise noted on the plans Traffic Control Devices also include work area signs indicating fines. These signs shall be installed 500' (150 m) after the first maintenance of traffic sign installed for each project. The signs shall be installed in both directions on the road under construction. The sizes, messages, and designs shall as shown in the Sign Fabrication Manual or as directed by the Engineer. With the larger size used for four lane expressway roadways with speeds of 55 MPH or greater and the smaller sign used for two lane roadways with speeds of 50 MPH or greater and with an ADT at 3,000 or greater. A 12' x 6' expressway sign (Item 636011-* - 300 units) placed behind guardrail on 3-4 #BB U-Channel or on 3 - 4" x 4" wood post or 8' x 4' - two lane highway sign (Item 636011-* - 180 units) placed behind guardrail on 2 - 4 #BB U-Channel or on 2 - 4" x 4" wood post. The u-channel supports used shall be from the Division Approved Products List.

If the project is on an Interstate Highway, an APD (Appalachian Highway Corridor), a controlled access highway with posted speed limit of 40 Miles Per Hour (MPH) or greater, or if otherwise noted on the plans, Traffic Control Devices shall include work area signs designated "GIVE 'EM A BRAKE" (GEAB). The sign size, message, and design shall be as shown on Sign Fabrication G30-1 or as directed by the Engineer.

The sign (Item 636011-*, 300 units) shall be installed 500'-1500' after the first lead-in work area sign unless the work zone is greater than one (1) mile, in length, in which case the GEAB sign shall be installed approximately ¼ mile in advance of the active work area. At no time shall the GEAB sign be closer than 500' from any other work area signing. The sign shall be installed in both directions on the right side of the highway. All GEAB signs not behind guardrail shall be installed on three, 3 pound per foot u-channel posts driven to a depth of 3 ½ feet. The posts shall utilize stubs driven to a depth of 3-1/2 feet and shall not extend above ground level more than four (4) inches. An appropriate length upper support u-channel shall be connected to each stub using a breakaway mechanism, appropriate for the operating speed of the roadway, recommended by the u-channel manufacturer which will result in the assembly meeting the crashworthiness requirements of ~~either NCHRP 350 or AASHTO~~ the Manual for Assessing Safety Hardware, 2016

Edition (MASH)~~, latest edition~~. If the assembly is installed behind guardrail, the supports may be direct driven without a splice, or stubs may be used with the upper supports connected using a method approved by the Engineer, or 2 – 4 #BB U-channel supports may be used. The u-channel supports used shall be from the Division Approved Products List.

GEAB sign shall only be installed in active work areas where workers are present and visible to passing motorists. During periods of inactivity in the work area, the GEAB sign(s) shall be covered or removed.

~~All traffic control devices manufactured on or before December 31, 2019 shall meet the crash testing performance requirements of National Cooperative Highway Research Program Report 350 (NCHRP-350) and/or the American Association of State and Highway Transportation Officials Publication Manual for Assessing Safety Hardware (AASHTO-MASH), 2009 or 2016. With the exception of Category 1 (as defined by FHWA) work zone devices, all devices shall have a supporting NCHRP-350 and/or AASHTO-MASH eligibility letter from the FHWA. Category 1 devices shall have a supporting NCHRP-350 self-certification letter from the device manufacturer or an AASHTO-MASH eligibility from FHWA. Devices, including portable barriers, manufactured after December 31, 2019 must have been successfully tested to the 2016 edition of AASHTO-MASH. Such devices manufactured before this date may continue to be used throughout their normal service lives.~~

~~All devices shall be assembled and utilized in a manner that is consistent with the crash testing of the devices. For example, portable sign stands shall only be used within the parameters of the crash testing of the stands unless otherwise allowed for in the FHWA eligibility letter or by other official guidance or policy from FHWA regarding NCHRP-350 or AASHTO regarding MASH. In the case of portable sign stands for example, these parameters include, but are not necessarily limited to sign mounting height, sign substrate material, maximum sign size, and the application of warning lights. Unless included as part of the testing of the device or allowed for as part of the manufacturer's self-certification for Category 1 devices, additional ballast added to devices shall only be as allowed for in the FHWA acceptance letter or by other official guidance or policy, as described previously.~~

~~Devices shall be a model listed on the Division's Approved Products List (APL), as applicable. Devices compliant with NCHRP-350 or MASH Test Level 3 may be utilized on all roadways. Devices compliant with NCHRP-350 or MASH Test Level 2 shall not be utilized on roads having a normal posted speed limit greater than forty (40) MPH. Devices compliant with NCHRP-350 or MASH Test Level 1 shall not be utilized on roads having a normal posted speed limit greater than twenty-five (25) MPH.~~

Except as allowed for herein, temporary traffic control drums, channelizer cones, surface mounted flexible tubular markers, soil anchored flexible delineator posts, portable barricades, and portable sign stands used on projects let after December 31, 2019 shall be listed on the Division's MASH APL's for such devices. Cones used on such projects shall also be MASH compliant. Such devices manufactured on or before and meeting the below requirements for projects let on or before December 31, 2019 may be used on projects let on or before December 31, 2022. For projects let on or before December 31, 2019, devices meeting the requirements described above may be used; otherwise, such devices shall be listed on the Division's National Cooperative Highway Research Program Report 350 (NCHRP-350) APL's for such devices, if a NCHRP-350 APL exists, or shall otherwise be NCHRP-350 compliant. Specific device requirements, including APL qualification requirements and documentation required to demonstrate compliance with the

applicable crash testing performance standard, are contained in Materials sections 715.9.3 for the above described channelization devices and section 715.9.5 for portable sign stands.

All devices shall be assembled and utilized in a manner that is consistent with the manufacturer's recommendations pertaining to parameters such as size, weight, placement, and material makeup of potential device attachments; location, weight, and material makeup of additional device ballast, etc.

September 13, 2019

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 636
MAINTAINING TRAFFIC

636.25-PAY ITEMS:

REPLACE ITEM 636023 AND NOTE IN THE TABLE AND REPLACE THE FOLLOWING.

ITEM	DESCRIPTION	UNIT
636023-*	Temporary Traffic Signal, "location" Note 1	Month

Note 1: "location" shall be designated as "01", "02", etc. for each different physical location as designated on the plans. Each different physical location shall include all individual temporary traffic signals required at the location.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 687
SHOP PAINTING METAL STRUCTURES

687.2-GENERAL:

687.2.1-Surface Preparation:

687.2.1.2-Blasting:

DELETE SUBSECTIONS 687.2.1.2.1, 687.2.1.2.2, 687.2.1.2.3, AND 687.2.1.2.4 AND REPLACE WITH THE FOLLOWING:

687.2.1.2.1-Commercial Blast: Shall meet the requirements of SSPC-SP 6/NACE 3 prior to painting. The appearance of the steel surface after blast cleaning shall correspond to the applicable and current SP 6 pictorial standards of SSPC Vis 1.

687.2.1.2.2-Brush-Off Blast: Shall meet the requirements of SSPC-SP 7/ NACE 4 prior to painting. The appearance of the steel surface after brush off blast cleaning shall correspond to the applicable and current SP 7 pictorial standards of SSPC Vis 1.

687.2.1.2.3-Near White Metal Blast: Shall meet the requirements of SSPC-SP 10/ NACE 2 prior to painting. The appearance of the steel surface after blast cleaning shall correspond to the applicable and current SP 10 pictorial standards of SSPC Vis 1.

687.2.1.2.4-White Metal Blast: Shall meet the requirements of SSPC-SP 5/ NACE 1 prior to painting. The appearance of the steel surface after blast cleaning shall correspond to the applicable and current SP 5 pictorial standards of SSPC Vis 1.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 688
FIELD PAINTING METAL OF METAL STRUCTURES

688.2-GENERAL:

687.2.1-Surface Preparation:

688.2.2.2-Blasting:

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

688.2.2.2.1-Commercial Blast: Shall meet the requirements of SSPC-SP 6/NACE 3 prior to painting. The appearance of the steel surface after blast cleaning shall correspond to the applicable and current SP 6 pictorial standards of SSPC Vis 1.

688.2.2.2.2-Brush-Off Blast: Shall meet the requirements of SSPC-SP 7/NACE 4 prior to painting. The appearance of the steel surface after brush-off blast cleaning shall correspond to the applicable and current SP 7 pictorial standards of SSPC Vis 1.

688.2.2.2.3-Near White Metal Blast: Shall meet the requirements of SSPC-SP 10/NACE 2 prior to painting. The appearance of the steel surface after blast cleaning shall correspond to the applicable and current SP 10 pictorial standards of SSPC Vis 1.

688.2.2.3-Water Jetting: Shall meet the requirements of ~~SSPC-SP 12, section 2.1.6 "Ultrahigh-Pressure Water Jetting" (UHP WJ)~~ SSPC-SP WJ-1/ NACE WJ, visual standard condition WJ-1, prior to painting.

688.3-COMPLETE PAINTING OF EXISTING STRUCTURES:

688.3.4-Painting Sequence:

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

FULL PRIME COAT:

The structure shall receive one coat of a primer meeting the requirements of Section 711 of the Standard Specifications. The full prime coat shall be applied before the stripe prime coat. The primer used for the full prime coat and the stripe prime coat

shall be of the same type and shall be from the same manufacturer. Dry film thickness requirements shall be as specified by the manufacturer's recommendations, or as specified in the contract documents.

STRIPE ~~PRIME~~ COAT:

All edges, outside corners, seams, bolt heads and nuts, all rivet heads, edges of flanges and plates, welds, sharp edges, in general all edges, shall receive one stripe coat, by brush or roller application, of the same primer as the Full Prime Coat. Striping shall extend a minimum of one inch (2cm) from the edge. The prime coat shall at a minimum, be set-to-touch before the stripe coat is applied. No dry film thickness is specified for this coat. This coat shall be tinted as allowed by the manufacturer to be in contrast to the full prime coat and intermediate coat. The tinting agent shall be the paint manufacturer's approved tinting agent.

INTERMEDIATE COAT:

The structure shall receive one uniform coat of a paint meeting the requirements of Section 711 of the Standard Specifications. The color shall be in contrast to the prime and top coats. If tinting is required, the tinting agent shall be the paint manufacturer's approved tinting agent. The intermediate coat shall not be applied until the primer and stripe coat have fully cured according to the manufacturer's recommendations. Dry film thickness requirements shall be as specified by the manufacturer's recommendations, or as specified in the contract documents.

CAULKING:

Caulking shall be applied before the application of the topcoat. This includes all seams between diaphragm connections to stiffeners and splices; and seams between any connection that is riveted or bolted. Any welded connections that are not fully sealed by the weld shall be caulked with a paste type caulk. The caulk shall be pressed into the seams between the adjoining surfaces, by wetted finger or specialty tool, to insure bond and provide a smooth uniform surface. Bottom seams shall not be caulked on vertical surfaces.

Caulking in a 3-coat system shall be applied after the intermediate coat has cured. Caulking on a 2-coat system shall be applied after prime coat has cured. The top coat shall not be applied until the caulking has fully cured in accordance with the manufacturer's recommendations.

The caulking material shall be compatible with the paint system being applied and shall be by written recommendation of the paint manufacturer. The caulking material shall be tested for compatibility with the paint system at the same time that the paint is tested for intercoat compatibility. Caulking operations shall be performed only when weather conditions are within the parameters as specified in section 688.2.3.1.

TOP COAT:

The structure shall receive one uniform coat of paint as designated in the plans meeting the requirements of Section 711 of the Standard Specifications. The color shall be as designated in the plans and shall be in accordance with current ~~Federal Standard 595~~ SAE-AMS-STD-595. Dry film thickness requirements shall be as

specified by the manufacturer's recommendations, or as specified in the contract documents.

688.5-FIELD PAINTING OF SHOP PRIME-COATED STEEL:

688.5.6-Paint Sequence:

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

Painting shall be in accordance with Section 688.3.4, with the exception of the Full Prime Coat and Stripe Coat. Paint containment shall be a minimum of Class 3P as specified in the current edition of SSPC Guide 6 or minimum specified in NIICAP (NACE International Institute Contractor Accreditation Program) AS-2 standards.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 704
STONE AND CRUSHED AGGREGATE

704.7-FILTER MATERIAL:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

Filter material shall consist of sand, other approved inert material, or a combination thereof, having hard, strong, durable particles. The material shall contain no more than a total of five percent coal, clay lumps, shale, soft fragments, organic matter, and other local deleterious substances.

The material shall conform to the following gradation:

U.S. Standard Sieve Size	Percent Passing, by Weight
2 in. (50 mm)	100
No. 4 (4.75~~ µm~~ mm)	65-100
No. 40(~~4.25~~ 425 µm)	25-50
No. 200 (75 µm)	0-25

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 709
METALS

ADD THE FOLLOWING SUBSECTION:

709.56-U-Channel Supports and Breakaway Splice Devices: U-channel supports utilized by the Division on projects for use as sign supports and other applications include two (2) lb/ft and three (3) lb/ft sizes. In addition, two (2) lb/ft and three (3) lb/ft supports are combined to create four (4) lb/ft and six (6) lb/ft back to back supports.

Approved two (2) lb/ft and three (3) lb/ft size supports, as well as approved Breakaway Splice Devices for such supports shall be listed on the Division Approved Product List (APL) for galvanized steel u-channel sign posts. The APL is established based on the requirements set forth in Materials Procedure (MP) 707.02.13. All u-channel supports used on projects shall meet the requirements specified herein in addition to the certification, sample testing, and manufacturing facility inspection requirements set forth in MP 707.02.13.

All u-channel supports shall be manufactured of steel meeting the requirements of ASTM Specification A1075 Grade 60 and unless otherwise specified, shall be galvanized in accordance with ASTM Specification A123.

The availability of a manufacturer supplied breakaway splice device, meeting the requirements specified herein, for use with two (2) lb/ft and three (3) lb/ft supports shall be required for approval of the supports.

In addition to the above requirements, two (2) lb/ft and three (3) lb/ft size supports shall be designed and tested to be "crashworthy" under the following conditions:

i. Supports are directly driven into strong soil, as defined in the AASHTO Manual for Assessing Safety Hardware, 2nd Edition (MASH), to the depths specified on Sheet TE1-7A of the WVDOH Standard Details Book Volume II (Standard Details).

ii. No limit shall be placed on the total number of supports. However, no more than two (2) supports shall be placed laterally within a seven (7) foot wide path when the supports are directly driven with no splice connection, and no more than three (3) supports shall be placed laterally within a seven (7) foot wide path when a support stub is used, and the stub and upper support are connected using the manufacturer recommended breakaway splice device.

iii. Traffic signs are securely mounted to the supports in accordance with the mounting height guidelines provided on Sheet TP3-1A of the Standard Details.

The manufacturer recommended breakaway splice device shall meet the following requirements:

a. Shall be compatible with the manufacturer's two (2) lb/ft and three (3) lb/ft size supports. Differences in the dimensioning of components used with each size support is permissible.
b. Shall create a splice connection between the stub support and upper support which maintains the full strength of the support.
c. Components shall be manufactured of aluminum, stainless steel, galvanized steel, exterior grade epoxy coated steel, or similar material exhibiting weather resistance equal to or greater than those described.
d. Shall require no modifications to the stub or support.
e. Shall be designed such that the typical breakaway point upon impact does not extend more than four (4) inches above ground level. The device shall require no more than two (2) inches of soil to be removed from around the stub during installation in order to meet this requirement.
f. Shall be designed such that after impact, the remaining portions of the device shall not be above the elevation of the top of the stub prior to impact.
g. Shall minimize the risk to pedestrians during and after impacts by not incorporating components which become independent projectiles, or which become potentially hazardous shards projecting above grade.
h. May require the replacement of a portion of, or up to all of the device components after impact; however, repair or replacement after impacts shall not be time consuming or labor intensive and shall be accomplished with common hand tools. The required use of power or specialized equipment to remove damaged components and/or to complete repairs, including instances where the device has been impacted directly by a vehicle tire or undercarriage, shall be unacceptable.

"Crashworthy", as specified herein, shall be defined as compliance with the crash testing requirements of MASH at Test Levels I, II, and III for projects let after December 31, 2019.

The manufacturer shall supply installation instructions and all required components and hardware for the breakaway splice device to the Contractor. The manufacturer shall make available installation instructions for posting and dissemination by the Division to Contractors and maintenance personnel.

709.56.1 - Product Submission and Approval: Manufacturers intending to supply products covered by this specification shall submit product information to the Materials Division following the current procedures specified in MP 106.00.02. The procedures specified in MP 707.02.13, as well as any additional procedures specified herein, will be followed in evaluating the product for approval.

The manufacturer should include all relevant documentation and information, including but not limited to product data sheets, product flyers, manufacturer product

specifications and recommendations, product bulletins, product manuals, engineering drawings, crash testing performance documentation, and any other requested information such as repair time and repair part cost data. The manufacturer shall be required to demonstrate the crashworthiness of the supports and breakaway splice devices as part of the submittal. These components shall be demonstrable to meet the crash testing standards specified herein by means specified in official guidance issued by the WVDOH.

In addition to the above, field evaluation installations of the manufacturer's breakaway splice device shall typically be required prior to approval. Evaluation installations installed by or for the Division shall demonstrate levels of durability, reliability, performance, and ease of installation/repair determined to be acceptable to Division evaluation personnel. The duration of the field evaluations shall typically be a minimum of six months to one year. Specific details related to this testing, such as locations and quantities, shall be determined by the Division. Initial and typical repair material costs associated with the breakaway splice device may also be considered as part of the evaluation.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 715
MISCELLANEOUS MATERIALS

715.9-WARNING DEVICES:

ADD THE FOLLOWING SUBSECTION:

715.9.5-Portable Sign Stands: Portable sign stands shall be designed for use with temporary traffic control signs manufactured of rigid aluminum, rigid composite, and/or flexible roll-up materials. Portable sign stands shall be designed and tested to meet the following requirements:

i. Shall provide for a minimum sign mounting height of one (1) foot for thirty-six (36) inch and forty-eight (48) inch diamond signs above the surface that the base of the stand is resting on.
ii. Support legs shall have a retracted position for use on narrow shoulders and with smaller signs, and an extended position for use on wider shoulders and with larger signs.
iii. With the support legs deployed, the side to side footprint taken up by the stand shall not exceed sixty (60) inches with the legs in the extended position and shall not exceed thirty-six (36) inches with the legs in the retracted position.
iv. When using thirty-six (36) inch diamond signs with the legs in the retracted position, and forty-eight (48) inch diamond signs with the legs in the extended position, the stand shall remain in place, upright, and oriented correctly in wind gusts created by typical 55 MPH and 70 MPH speed limit traffic, respectively. Additional ballast in accordance with the specifications herein is permissible. The stand's mechanism of wind spilling shall not result in the sign being oriented such that the sign message is illegible to drivers for excessive durations.
v. Shall be "crashworthy" when utilized in accordance with the manufacturer's recommendations, and when impacted from any angle.

"Crashworthy" shall be defined as meeting the crash testing performance requirements of the 2016 edition AASHTO Manual for Assessing Safety Hardware (MASH) at Test Levels I, II, and III for projects let after December 31, 2019. Stands manufactured on or prior to December 31, 2019 that do not meet MASH may be used on projects with a letting date on or prior to December 31, 2022, provided the stands meet the crash testing performance

requirements of National Cooperative Highway Research Program Report 350 (NCHRP-350) Test Levels I, II, and III.

Manufacturer recommendations for use of the stands shall be within the scope of the successful crash testing. Scope shall include parameters such as size, weight, placement, and material makeup of potential device attachments, including signs; location, weight, and material makeup of additional device ballast; etc. Manufacturer instructions regarding such parameters may be outside the scope of testing only if allowed for in a supporting FHWA eligibility letter or by written guidance or policy issued by the FHWA or AASHTO.

715.9.5.1-Product Submission and Approval: Stands to be considered for inclusion on the Division's Approved Products List (APL) shall be submitted to the Materials Division following the current procedures specified in MP 106.00.02. The Division maintains an APL of MASH compliant stands only. Stands utilized based on compliance with NCHRP-350 are not required to be listed on an APL.

The manufacturer should include all relevant documentation and information, including but not limited to Product Data Sheets, Product Flyers, Manufacturer Product Specifications, Product Bulletins, Engineering Drawings, and crash testing performance documentation. The crash testing performance documentation to be submitted shall be in accordance with official guidance issued by the WVDOH.

Approvals of stands may be rescinded based on performance on Division projects determined to be non-compliant with these specifications.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

ADD THE FOLLOWING:

SECTION 900
RAILROAD

901.1-901.5-BLANK:

901.6-REMOVE EXISTING TRACK:

This work shall consist of the removal of the existing track, tie plates, spikes and joint bars as noted in the plans.

All construction methods, materials, workmanship and equipment to conform to the applicable sections of AREMA 2019 Manual for Railway Engineering.

901.6.1-Construction: After completion of Special Provision 639 for Construction Layout Stakes the existing: rails, tie plates, spikes and joint bars with the associated hardware are to be removed and stockpile neatly within the Temporary Construction Area. The Contactor shall notify the railroad and arrange for pickup of this material and assist with loading on provided vehicles if requested.

The contractor shall be responsible for the disposal of any removed existing ties at an approved landfill.

901.7-MISCELLANEOUS RAILROAD, SIGNAL EQUIPMENT REMOVAL:

This work shall consist of the removal, salvage, delivery and/or disposal of existing at-grade railroad crossing signal equipment.

901.7.1-Construction: The equipment and materials removed by the contractor shall become the property of the contractor, with the exception of the controller cabinet and all associated equipment within the enclosure.

When a foundation is to be abandoned, the top of foundation, anchor bolts, and conduits shall be removed to a depth not less than 6 inches below the proposed roadway pavement

subbase or unimproved ground. Any resulting hole shall be backfilled with material equivalent to the surrounding material.

The entire controller cabinet enclosure and all internal parts and software shall be salvaged and returned to Winchester & Western Railroad. The contractor shall deliver the salvaged equipment to 245 Tavern Road, Martinsburg, WV 25404.

The controller shall be packaged securely in the enclosure so that it shall not be dislodged from the shelf while shipping. Damaged items shall be repaired at the contractor's expense. The controller cabinet shall all internal parts shall be returned in the same condition as it was when taken from the site within five (5) days of removal. All equipment is presumed to be working unless otherwise noted by the Winchester & Western Chief Engineer. The chief engineer shall inspect and note any damaged and take the serial number of the items described above prior to shipping.

Winchester & Western Railroad is required to document all salvaged equipment and store it for use at another DOH roadway crossing only.

901.8-MISCELLANEOAU RAILROAD, FURNISH & INSTALL NEW 136 RE RAIL WITH #5 WOOD TIES (9" x 7" x 8'-6") AND SPIKES:

This work shall consist of the reconstruction of the existing track, as directed in the plans. It shall include the removal and replacement of existing rail and ballast and installation of continuously welded rail on new ties and ballast.

Connections to existing track at the limits of work shall consist of lengths 115 RE rail per the plans to meet the existing rail sections. Compromise field welds shall be used for the connection between different sizes of rail.

All construction methods, materials, workmanship and equipment to conform to the applicable sections of AREMA 2019 Manual for Railway Engineering.

901.8.1-Materials: Shall conform to the following.

Ballast-per AREMA 2019 "Manual for Railway Engineering", Chapter One, Part Two Shall be composed of hard, angular, granite, trap rock or limestone free of deleterious substances and conform to the AREMA Manual. Slag shall not be considered a suitable ballast material. Ballast shall be AREMA Size 3.

Ties-per AREMA 2019 "Manual for Railway Engineering", Chapter 30. Ties shall be 9" x 7" x 8'-6", Grade 5. Ties shall be 100% end plated with gang nails sized to cover a minimum of 75% of the end of the tie. All end plates shall be applied prior to seasoning and treatment. All ties shall have a minimum of seven (7) lbs. per cubic foot pressure treatment with the preservatives consisting of sixty percent (60%) creosote, forty percent (40%) coal tar solution and conforming to American Wood Preservatives Association specifications.

Rails-per AREMA 2019 "Manual for Railway Engineering", Volume 1, Chapter 4. Rail shall be new control cooled 136RE and continuously welded throughout the limits of work. 115RE rail shall be used to transition rail section size to the meet the existing rail per the plans. The staggering of joints at tie-ins to the existing track structure shall not be less than

four feet (4') apart. Insulated joints for grade crossing signal circuits shall be manufactured by Allegheny, Seneca or an approved equal.

Tie plates-per AREMA 2019 "Manual for Railway Engineering", under the new 136 RE rail shall be 7-3/4" x 13" double shoulder with 1:40 cant.

Cut Spikes-Per AREMA 2019 "Manual for Railway Engineering", Volume 1, Chapter 5, Part 2, 5/8" x 6" AREMA grade soft-steel.

Rail Anchors-per AREMA 2019 "Manual for Railway Engineering", Rail anchors shall be new drive on to fit 136 RE rail. Box anchor ties per the plans.

Compromise Welds-Confirm rail sizes prior to ordering weld kits.

901.8.2-Construction: Track outages shall not exceed durations approved in writing by Winchester & Western Railroad.

Excavated to the limits shown on the plans. Existing ballast under the proposed ties shall be reused. Excavate ditches to the limits shown on the plans and handle spoil to prevent contamination of ballast. Place tie on existing ballast at spacing shown on the plans, install rail, and place, shape and compact ballast by power equipment.

Welding is to be performed by certified welders under direct supervision of an experienced welding supervisor or foreman and must be certified by the weld kit manufacturer. Welding supervisors and/or foremen shall be familiar with FRA parts 213.119, 213.305, 213.341 and 213.343. Welded rails are to be clean of grease, oil, dirt, loose scale, and moisture to a minimum of 6 inches from rail ends, including the railhead surface. Each completed weld shall have full penetration and complete fusion and be free of cracks and fissures. Cut Rail square using approved rail saws. Torch cutting of rails will not be permitted. Rail ends shall show no steel defects, dents, or porosity before welding. Use a Power Grinder with an Abrasive Wheel to remove scale, rust, burrs, lipped metal and mill brands. A compromise weld shall not be supported with a cross tie.

All weld testing shall be performed by a qualified Independent Testing Agency certified to perform Ultrasonic Testing. Ultrasonic Testing shall be performed after the weld has been ground and finished and performed in accordance with ASTM E164. Equipment used shall be capable of detecting a 3/64-inch discontinuity, 6-1/2 inches below the top of rail. The testing agency shall provide test results directly to the Engineer.

Contractor shall furnish, maintain and operate standard railroad industry construction equipment in order to perform the work without damage to the remaining railroad facility and have sufficient equipment and personnel to complete the project in the time specified under seasonal weather conditions. All equipment shall conform to the standard prescribed by the Association of American Railroads, the Federal Safety Appliance Act, The State of West Virginia, and any other government authority and be in good operating condition.

Connect new track to existing track for freight deliveries.

901.9-MISCELLANEOUS RAILROAD, COMPROMISE WELDS:

This work shall consist of the furnishing and installation of welds. All construction methods, materials, workmanship and equipment to conform to the applicable sections of AREMA 2019 Manual for Railway Engineering

901.9.1-Construction: Welding is to be performed by certified welders under direct supervision of an experienced welding supervisor or foreman and must be certified by the weld kit manufacturer. Welding supervisors and/or foremen shall be familiar with FRA parts 213.119, 213.305, 213.341 and 213.343. Welded rails are to be clean of grease, oil, dirt, loose scale, and moisture to a minimum of 6 inches from rail ends, including the railhead surface. Each completed weld shall have full penetration and complete fusion and be free of cracks and fissures. Cut Rail square using approved rail saws. Torch cutting of rails will not be permitted. Rail ends shall show no steel defects, dents, or porosity before welding. Use a Power Grinder with an Abrasive Wheel to remove scale, rust, burrs, lipped metal and mill brands. A compromise weld shall not be supported with a cross tie.

All weld testing shall be performed by a qualified Independent Testing Agency certified to perform Ultrasonic Testing. Ultrasonic Testing shall be performed after the weld has been ground and finished and performed in accordance with ASTM E164. Equipment used shall be capable of detecting a 3/64-inch discontinuity, 6-1/2 inches below the top of rail. The testing agency shall provide test results directly to the Engineer.

901.10-MISCELLANEOUS RAILROAD, RAILROAD GRADE CROSSING WITH ASPHALT UNDERLAYMENT:

This work shall consist of the installation of an at grade rail crossing with asphalt underlayment.

All construction methods, materials, workmanship and equipment to conform to the applicable sections of AREMA 2019 Manual for Railway Engineering.

901.10.1-Materials: Shall conform to the following.
Asphalt Material-Shall conform to the requirements of Section 401.

Precast Concrete Grade Crossing Panels with Shunt Resistant Steel Clad with Rubber Flangeway Filler-Furnish as manufactured by OMNI, OMEGA Rail-Way Inc., or approved equal.

Geotextile-per AREMA 2019 “Manual for Railway Engineering”, Non-Woven, 12-16 oz/SY.

Ballast-per AREMA 2019 “Manual for Railway Engineering”, Chapter One, Part Two Ballast. Shall be composed of hard, angular, granite, trap rock or limestone free of deleterious substances and conform to the AREMA Manual. Slag shall not be considered a suitable ballast material. Ballast shall be AREMA Size 3.

Ties-per AREMA 2019 “Manual for Railway Engineering”, Chapter 30. Ties shall be 9” x 7” x 10’-0”, Grade 5. Ties shall be 100% end plated with gang nails sized to cover a

minimum of 75% of the end of the tie. All end plates shall be applied prior to seasoning and treatment. All ties shall have a minimum of seven (7) lbs. per cubic foot pressure treatment with the preservatives consisting of sixty percent (60%) creosote, forty percent (40%) coal tar solution and conforming to American Wood Preservatives Association specifications.

Rails-per AREMA 2019 "Manual for Railway Engineering", Volume 1, Chapter 4. Rail shall be new control cooled 136RE and welded through the crossing.

Tie plates-Pandrol rolled tie plates, Model TPL-P2-6" or approved equal.

Tie Plate Fasteners-Pandrol Hot Forged Steel Screw Spikes in accordance with ASTM A-66 specifications or approved equal.

Rail Fasteners-Pandrol e-clip or approved equal.

Underdrain-Shall conform to the requirements of Section 606.

901.10.2-Construction: Track outages shall not exceed durations approved in writing by Winchester & Western Railroad.

The subgrade shall be excavated to the depth required to allow for the proper placement of the materials prescribed herein. All unsuitable or otherwise objectionable materials shall be removed to a depth at which firm soil is reached and replaced with Engineer approved material. The asphalt underlayment shall be placed on the prepared subgrade, shaped and compacted in accordance with Section 401.

Ballast shall be placed, shaped and compacted ballast by power equipment in layers of not less than three inches (3"), and not exceeding six inches (6") in depth when compacted. Place panelized track sections on ballast, fill cribs and compact using power equipment.

When track has been compacted at proposed line and grade, install and secure crossing panels. Tie-in roadway to new crossing and open to traffic.

Connect new crossing to existing track for freight deliveries.

901.11-MISCELLANEOUS RAILROAD, STANDARD TWO-WAY FLASHERS ON RAILROAD SIGNAL WITH GATE:

This work shall consist of the design, furnishing and installation of flashing railroad signals, including the signal masts, gate arms, lights, controls, conduits, junction boxes, detection system, electrical circuits and connection to Electric Service as provided by others.

All construction methods, materials, workmanship and equipment to conform to the applicable sections of: AREMA 2019 Manual for Railway Engineering.

All electrical equipment shall conform to the standards of the National Electrical Manufacturers Association (NEMA), the Underwriters Laboratories Inc., (UL) or the Electronic Industries Association (EIA), whichever is applicable.

All electrical materials and workmanship shall conform to the requirements of the National Electrical Code (NEC), referred to as the Code; the American Society for Testing Materials

(ASTM); the American National Standards Association (ANSI); the American Wire Gauge (AWG), and any local ordinances that may apply.

901.11.1-Materials: All material shall be new. Suppliers must guarantee equipment against defects in material and workmanship for a period of one year from "In Service" date. The Contractor shall be responsible for any defects in workmanship and installation for a period of one year from "In Service" date. All equipment shall be installed and adjusted in accordance with the manufacturer's specifications and applicable AREMA recommendations, and shall be operating satisfactorily, prior to being placed "In Service". The Contractor shall be responsible for any loss or damage to equipment or materials prior to date of acceptance. Prior to placing any crossing protection system "In Service", the Contractor will be responsible for conducting all tests in accordance with FRA Regulations; Part 234 and a copy of the results will be forwarded to the Railroad Chief Engineer.

Signals shall be 12" Assemblies and shall be shatter resistant Light Emitting Diode (LED) Systems equipped with black backplates. All Signal Assemblies shall be manufactured by GE, Safetran, Western-Cullen-Hayes, Progress Rail Services, GRS or an approved equal.

Railroad Crossing Signs (R15-1) and other signs, as required, shall be aluminum, high intensity manufactured by GE, Safetran Systems, Progress Rail or an approved equal.

Structure foundations and signal masts shall be designed to meet the requirements of the AREMA Manual for Railway Engineering, 2019; and the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

Automatic gate arms and drive mechanism shall be provided for each signal mast.

All cable shall be free of splices and shall be direct burial, armored railroad vital circuit signal cable. Cable to the Signal Masts shall be one 5/C #6 or one 7/C #14. Track cable shall be 2/C #6 Twisted Pair. Cable to A/C Power shall be3/C #9. Cable for Circuit Controllers, etc., shall be 5/C #14 unless otherwise specified by the Engineer. All wiring and power service shall conform to Section 660 of the DOH Standard Specifications for Roads and Bridges, unless otherwise required by the Railroad.

A tag showing the DOT Number shall be installed on each signal mast. The tag shall be .032" thick aluminum plate with raised numerals and letters. The tag shall be 4" by 9" and manufactured with slots on each end to permit banding to the mast. Band shall be stainless steel 1/32" thick by ¾" wide. The DOT number shall be a minimum of 1½" minimum height.

901.11.2-Construction: The Contractor shall make all arrangements with the Power Company for connection, and obtain a meter and meter socket. The Contractor shall furnish, install, pay installation fee and provide all necessary materials for the power connection not provided by the Power Company.

Cable under the road shall be installed in 4" Schedule 80 PVC coated galvanized rigid steel conduit. Cable under the track shall be installed in 4" Schedule 80 PVC conduit. These conduits shall be installed at a minimum depth of 30" and shall extend a minimum of 4' beyond the edges of the highway and 4' beyond the rail.

The Standard Railroad Power Service shall include a 20' minimum Class 5 wood pole. Service shall be 120 Volt, 60 Amp minimum, with meter base, disconnect and etc., per the Utility Company specifications and local jurisdiction requirements.

Prior to placing any crossing protection system "In Service", the Contractor will be responsible for conducting all tests in accordance with FRA Regulations; Part 234 and a copy of the results will be forwarded to the Railroad's Owner.

901.12-MISCELLANEOUS RAILROAD, CONTROL CABINET:

This work shall consist of the design, furnishing, configuration and installation of the controller cabinet associated with the at-grade railroad crossing including all necessary controls, conduits, mountings, enclosure, electrical circuits and wiring.

All construction methods, materials, workmanship and equipment to conform to the applicable sections of AREMA 2019 Manual for Railway Engineering.

All electrical equipment shall conform to the standards of the National Electrical Manufacturers Association (NEMA), the Underwriters Laboratories Inc., (UL) or the Electronic Industries Association (EIA), whichever is applicable.

All electrical materials and workmanship shall conform to the requirements of the National Electrical Code (NEC), referred to as the Code; the American Society for Testing Materials (ASTM); the American National Standards Association (ANSI); the American Wire Gauge (AWG), and any local ordinances that may apply.

901.12.1-Materials: All material shall be new. Suppliers must guarantee equipment against defects in material and workmanship for a period of one year from "In Service" date. The Contractor shall be responsible for any defects in workmanship and installation for a period of one year from "In Service" date. All equipment shall be installed and adjusted in accordance with the manufacturer's specifications and applicable AREMA recommendations, and shall be operating satisfactorily, prior to being placed "In Service". The Contractor shall be responsible for any loss or damage to equipment or materials prior to date of acceptance. Prior to placing any crossing protection system "In Service", the Contractor will be responsible for conducting all tests in accordance with FRA Regulations; Part 234 and a copy of the results will be forwarded to the Railroad Chief Engineer.

The controller shall be an ElectroLogIXS PMD-4 model or approved equal. Approval subject to review by Winchester & Western Railroad.

901.12.2-Construction: The enclosure shall have nominal dimensions of 8 foot width by 8 foot depth, mounted approximately 12 inches above final grade. Crusher run aggregate shall be installed beneath the enclosure for maintenance. Four 5-inch conduit bends shall be installed in the enclosure base.

Prior to placing any crossing protection system "In Service", the Contractor will be responsible for conducting all tests in accordance with FRA Regulations; Part 234 and a copy of the results will be forwarded to the Railroad's Owner.

901.13-901.14-BLANK:

901.15-METHOD OF MEASUREMENT:

The quantities of work will be measured as follows:

901.15.1-901.15.5-Blank

901.15.6-Remove Existing Track: This item will be paid as Linear Foot which price shall be full compensation for removal, including all labor, equipment, materials, supplies, and incidentals necessary to complete the work.

901.15.7-Miscellaneous Railroad, Signal Equipment Removal: This item will be paid as a Lump Sum, which price shall be full compensation for removal, salvage, delivery and/or disposal of existing railroad signal equipment, as well as all equipment, materials and incidentals necessary to complete the work. The Contractor shall be responsible for delivering salvaged equipment to Winchester & Western Railroad. Any damage in shipping or removal shall be repaired at the contractor's expense. No additional compensation will be provided.

901.15.8-Miscellaneous Railroad, Furnish & Install New 136 RE Rail with #5 Wood Ties (9" x 7" x 8'-6") and Spikes: This item will be paid as Linear Foot, complete in place, which price shall be full compensation for furnishing, placing, and doing all work in the work prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, materials and incidentals necessary to complete the work.

901.15.9-Miscellaneous Railroad, Compromise Welds: This item will be paid as Each, complete in place, which price shall be full compensation for furnishing, placing, including all labor, equipment, materials and incidentals.

901.15.10-Miscellaneous Railroad, Railroad Grade Crossing with Asphalt Underlayment: This item will be paid as Each, complete in place, which price shall be full compensation for furnishing, placing, including all labor, equipment, materials and incidentals.

901.15.11-Miscellaneous Railroad, Standard Two-Way Flashers on Railroad Signal with Gate: This item will be paid as per Each, which price shall be full compensation for designing, furnishing, placing and resetting when necessary, including all labor, equipment, materials and incidentals necessary to complete the work. The Contractor shall be responsible for designing all equipment, structures, and circuitry to the pertinent standards at no additional cost to the DOH.

901.15.12- Miscellaneous Railroad, Control Cabinet: This item will be paid as per Each, which price shall be full compensation for designing, furnishing, placing and resetting when necessary. The item shall consist of complete electrical mechanism for controlling the operation of signals and gate, including all labor, equipment, materials and incidentals. The Contractor shall be responsible for designing all equipment, structures, and circuitry to the pertinent standards at no additional cost to the DOH.

901.16-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
900001-003	Remove Existing Track	Linear Foot
900005-001	Miscellaneous Railroad, Signal Equipment Removal	Lump Sum
900005-002	Miscellaneous Railroad, Furnish & Install New 136 RE Rail with #5 Wood Ties (9” x 7” x 8’-6”) and Spikes	Linear Foot
900005-003	Miscellaneous Railroad, Compromise Welds	Each
900005-003	Miscellaneous Railroad, Railroad Grade Crossing with Asphalt Underlayment	Each
900005-003	Miscellaneous Railroad, Standard Two-Way Flashers on Railroad Signal with Gate	Each
900005-003	Miscellaneous Railroad, Control Cabinet	Each

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

107.8-RAILWAY-HIGHWAY PROVISIONS:

ADD THE FOLLOWING AT THE END OF THE FIRST PARAGRAPH:

The Railroad Chief Engineer for the project is Winchester & Western Railroad.

July 12, 2019

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 212
STRUCTURE, ROCK, AND WET EXCAVATION

212.3-MATERIALS:

ADD THE FOLLOWING:

Contractor shall furnish, maintain and operate standard railroad industry construction equipment in order to perform the work without damage to the remaining railroad facility and have sufficient equipment and personnel to complete the project in the time specified under seasonal weather conditions. All equipment shall conform to the standard prescribed by the Association of American Railroads, the Federal Safety Appliance Act, The State of West Virginia, and any other government authority and be in good operating condition.

July 12, 2019

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 639
CONSTRUCTION SURVEYING

639.3-CONSTRUCTION LAYOUT STAKES:

ADD THE FOLLOWING.

The Contractor shall establish, and reference a Baseline for the existing Railroad along the centerline of track, make all calculations involved, furnish and place all layout stakes. The Engineer has established reference control points for the Project.

The Contractor shall stake the Baseline, Establish three (3) reference points and profile the existing and proposed rails at fifty (50) foot intervals.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 506
CONCRETE PAVEMENT REPAIR

DELETE THE ENTIRE CONTENTS AND REPLACE THE FOLLOWING:

506.1-DESCRIPTION:

This work consists of the removal and replacement of deteriorated concrete pavement and patches, and replacing subbase material where required, at locations as shown on plans or as specified by the Engineer.

The following is a description of each patch type:

i. Jointed Concrete Pavement Patch, Type I:
Patching shall consist of full depth, full lane width concrete pavement repairs equal to or greater than ~~6~~ 4 feet (~~1.8~~ 1.2 meters) in length. Type I patches shall constructed in accordance with the Concrete Repair Details in the plans.

ii. Jointed Concrete Pavement Patch, Type II:
Patching shall consist of partial depth concrete pavement repairs that extend a minimum of 2 inches (50mm) and no deeper than one-half the slab thickness at cracks or no more than one-third the slab thickness at doweled joints. Type II patches shall be constructed in accordance with the Concrete Repair Details in the plans.

iii. Jointed Concrete Pavement Patch, Type III:
Patching shall consist of a repair along the edge of a transverse crack or joint that extends from the bottom of a partial depth repair (Type II) to potentially the full depth of the slab, and isolated within 12” of either the longitudinal joint or pavement edge. Type III patches shall be constructed in accordance with the Concrete Repair Details in the plans.

506.2-MATERIALS:

Materials shall meet the requirements of section 501 or 601, and as follows:

MATERIAL	SECTION OR SUBSECTION
Accelerating Admixtures	707.13
Curing Materials	707.6-707.10
Epoxy-Coated Dowel Bars	709.15
Joint Sealer	708.3, 708.4
Portland Cement Concrete	501 or 601

Subbase	307
Tie Bars and Hook Bolts	709.1

A~~n approved~~ non-shrink cementitious ~~epoxy~~ grout meeting the requirements of ASTM C1107 or an approved epoxy adhesive meeting the requirements of AASHTO M 235, Type IV, Grade 3, Class B or C shall be used to firmly anchor dowel bars in 30 minutes. This material shall be approved by the Engineer for the intended application.

Cement meeting the requirements of ASTM C150, Type III may be used in the concrete mixes for concrete pavement repair.

506.3-PROPORTIONING:

Portland cement concrete for patching concrete pavement shall meet the requirements of Section 501, or Class B or Modified Class B as specified in Section 601, except that it shall be shown by compressive strength tests, in the approved mix design, that the concrete mix shall attain 2,000 psi (13.8 Mpa) prior to the time at which the pavement will be opened to traffic. Also, the maximum water-cement ratio (w/c) shall be 0.44, and an AASHTO number 8 coarse aggregate shall be required in Type II repairs with a depth of 3 inches (75 mm) or less.

Type III repairs may be placed simultaneously with Type II repairs. When constructed in this manner, the same concrete mix shall be used in both repair types.

Prior to the start of work, the Contractor shall submit the mix proportions and recent compressive strength test data for the specified age at which the concrete is to be opened to traffic.

506.4-TESTING:

All testing shall be in accordance with section 501. The Contractor shall fabricate a minimum of nine compressive strength cylinders for each 24 hour period of operation. Six of these nine field cured cylinders shall be field cured in a temperature and moisture condition as close as possible to that of the concrete in the repair area. When the average strength of three of these cylinders, representing the concrete placed, indicate that the concrete has attained the required strength for opening to traffic, that concrete may be put into service. These cylinders shall represent concrete produced from the batch from which they were fabricated and, if applicable, concrete from previous batches also. These cylinders will not represent any concrete which was placed after the time that they were fabricated. Three of the nine cylinders shall receive standard curing and shall be tested at 28days to verify that the required strength at that age has been achieved.

In lieu of six field cured cylinders required above, the Contractor may use the Maturity Method for the Estimation of concrete strength, as outlined in MP 601.04.21 for determining when the pavement may be opened to traffic.

506.5-EQUIPMENT AND TOOLS:

Equipment and tools shall be in accordance with section 501 unless noted otherwise. Saw cutting equipment shall be capable of sawing neat vertical faces along the patch boundaries. The use of a carbide-toothed wheel saw shall not be permitted for sawing the patch boundaries. A carbide-tipped wheel saw may be used for additional saw cuts provided that a minimum 3-inch (75 mm) clearance from the sawed boundary is maintained.

Gang drills shall be used to drill multiple dowel bar holes simultaneously for Type I repairs. The drilling equipment shall firmly hold the drill bits in a horizontal position at the correct height

and prevent them from wandering. The drilling equipment shall maintain holes with consistent diameters. Drilling equipment which damages existing concrete or causes the holes to exceed the specified diameter due to movement, bouncing, wobbling, etc. shall not be used. Drilling operations shall be stopped if the drilling equipment is deemed to be inadequate by the Engineer, and drilling operations shall not be resumed until adequate drilling equipment is used.

506.6-CONSTRUCTION METHODS:

506.6.1-Removal of Existing Pavement: Designated defective pavement shall be removed full depth, and undisturbed portions of the existing pavement adjacent to the area to be patched shall be left with straight vertical sides.

The existing pavement to be removed shall be sawed full depth along the transverse and longitudinal boundaries, including the lane and shoulder/lane joints as shown on the plans or as directed by the Engineer. Additional saw cuts inside the patch boundaries will be permitted to facilitate the concrete removal operation.

Concrete sawn full depth to be removed shall be lifted out by means of chains, lift-pins, or other approved devices. The breaking of concrete in-place shall not be permitted. During the removal operations, utmost care shall be exercised to minimize disturbance and damage to the base material, and the adjacent pavement and shoulder.

506.6.2-Conditioning Existing Subbase: Prior to placing concrete in the repair area, any subbase material that is disturbed below the desired level of cleanout shall be removed and the patch area compacted to the satisfaction of the Engineer. Unsuitable subbase material, concrete, reinforcing steel, and any other debris shall become property of the Contractor and shall be legally disposed. The Contractor shall replace the removed subbase material with concrete integral to pavement replacement ~~up to a maximum 1-inch (25 mm) depth. In the event that soft areas are encountered in the subbase or subgrade, or if more than 1-inch (25 mm) of subbase material is removed, replacement of subbase and subgrade shall be in accordance with Section 307, testing shall be waived. When subbase or subgrade material is replaced, it shall be brought to grade and compacted to the satisfaction of the Engineer~~. If more than an additional 1 inch (25 mm) of concrete is needed to replace subbase or subgrade material, then the additional volume of concrete, required to fill the excavated area up to the elevation of the bottom of the existing pavement, shall be paid for by the cubic yard (meter) as a separate pay item.

506.6.3-Placing Concrete: Unless behind permanent closures or unless otherwise approved by the Engineer, all excavated areas shall be patched the same day that they are excavated. The excavated area shall be thoroughly cleaned of loose material and debris and moistened prior to the placement of concrete.

Existing pavements shall not be removed if such removal will result in concrete being placed when the ambient air temperature is below 32° F, unless approved by the Engineer. Concrete for partial depth repairs shall not be placed when the ambient temperature is below 40° F. The concrete temperature at the time of placement shall not be less than 70° F and not more than 95° F, unless approved by the Engineer.

Concrete shall be deposited in the excavated area, and the free fall shall not be more than 3 feet (1 m). If the concrete does not fall into its final position in the patch, it shall be moved by means of shovels; raking is prohibited. The concrete shall be worked with tampers, spades,

or other tools to completely fill the patch area. Maximum effort will be used to ensure that the area beneath the existing concrete pavement is completely filled. Internal vibration shall be used.

Following the placing of the concrete, the surface will be struck off to a finished grade and floated to a smooth finish. Finishing of the plastic concrete shall conform to the requirements of Section 501.12 of the Specifications, except that the final concrete surface shall be textured similar to that of the adjoining pavement.

506.6.4-Straightedge Checking and Surface Correction: During finishing operations, deviations in adjacent lanes which are also to be repaired shall not be transferred to the new construction. The Contractor shall furnish and use straightedges to check the surface tolerance. For patches 10 feet (3 m) or more in length, a 10 foot (3 m) straightedge shall be used. Shorter straightedges shall be used for patches less than 10 feet (3 m) in length.

The minimum length straightedge shall be 6 feet (1.8 m). Section 501.12.6 shall govern except that the shorter straightedges shall be used for shorter patches.

506.6.5-Curing: Immediately after straight edging and texturing, the concrete shall be cured in accordance with Section 501.14. Where early opening to traffic is required, insulation mats or blankets may be used over the repairs during curing in order to accelerate strength gain.

506.6.6-Sealing Joints: When patching two lanes simultaneously, the longitudinal joint shall be reestablished by sawing. Joint sealing shall be done in accordance with Section 510.

506.6.7-Repair of Adjacent Shoulders: Within 24 hours after completion of a patch area, any adjacent shoulders damaged during pavement repair operations shall be reconstructed in accordance with the requirements of the applicable section of the specifications to match the finished shoulder grade and to the satisfaction of the Engineer. In the event traffic is to be permitted on the patch area prior to reconstruction of the shoulder, the Contractor shall first make such temporary repair to the shoulder as is necessary to avoid any hazardous condition.

506.6.8-Specific Construction Methods: Construction methods specific to each repair type are noted in the following sections.

506.6.8.1-Type I Repairs: Where the existing joint dowel assembly is to be removed, the existing concrete shall be saw-cut full depth and removed a minimum of 1 foot (300 mm) on either side of existing transverse joints. Minimum length of removal shall be ~~6~~ 4 feet (~~1.8~~ 1.2 m) in accordance with that shown in the WVDOH Concrete Repair Details. Multiple repairs shall be combined to make one large patch if the edges of adjacent repairs, in the same lane, are less than 10 ft (3 m) apart.

Oversawing into the adjacent slabs or shoulder shall be kept to the minimum amount necessary to ensure that full depth cuts in the corners have been achieved. All oversawing shall be cleaned and filled with an approved ~~epoxy~~ joint sealing material meeting the requirements of Section 708.3.

Any areas damaged during concrete sawing and removal operations shall be repaired to the satisfaction of the Engineer by extending the patch boundary or repairing spalls at

the Contractor's expense. Spalls greater than ¼ inch (6 mm) wide and 2 inches (50 mm) long and more than ½ inch (13 mm) deep below the pavement surface shall be repaired using an approved epoxy mortar. The patch boundary shall be extended by re-sawing the limits of the patch beyond the spalled area when spalls greater than 1 inch (25 mm) wide and 12 inches (300 mm) long and more than ½ inch (13 mm) deep below the pavement surface are created by the pavement removal operation.

A bond breaking material, approved by the Engineer, shall be placed at the longitudinal joint for Type I patches as shown in WVDOH Concrete Repair Details. Acceptable bond-breaking materials include white pigmented curing compound, roofing felt, and tar paper.

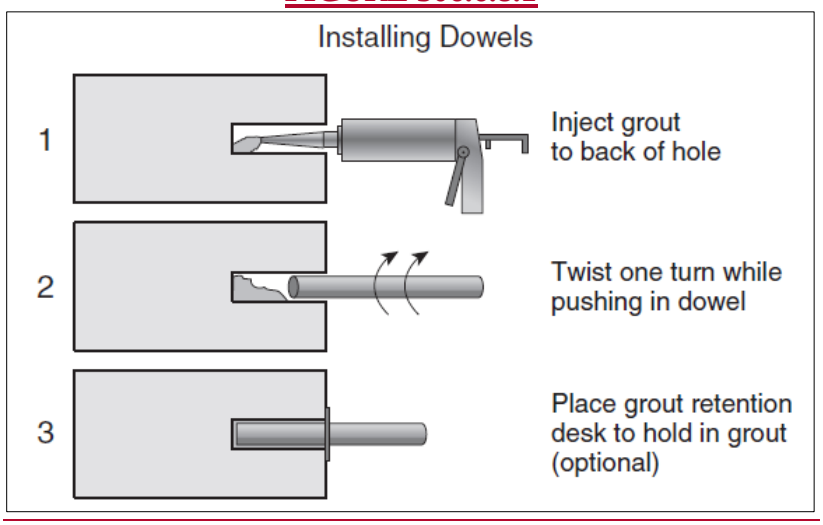
Where dowels are required, holes slightly larger than the diameter of the dowels shall be drilled 9 inches (225 mm) into the face of the existing slab starting 6 - 12 inches (150 – 300 mm) from either edge and then on 12-~~-~~inch (300 mm) centers. Hole diameters shall be 1⁄16 in. (1.6 mm) larger than the dowel bar diameter when using epoxy material to anchor the dowels, and hole diameters shall be 0.20 to 0.25 in. (5 to 6 mm) larger than the dowel bar diameter using when cementitious grout to anchor the dowels. The number of dowels per joint shall be as shown in the WVDOH Concrete Repair Details. The holes shall be located at a depth as shown in the WVDOH Concrete Repair Details. The dowels shall be carefully aligned (within ¼ inch (6 mm) over a 1-foot (300 mm) length) with the direction of the pavement and parallel to the plane of the surface. The drilled holes shall be thoroughly cleaned with compressed air to remove all dust, dirt, loose material and moisture. An approved quick setting, non-shrinking ~~mortar or an approved high viscosity epoxy~~ cementitious grout or epoxy adhesive shall be used to anchor the dowels in the holes. Before installing dowels, place the anchoring material (cementitious grout or epoxy adhesive) in the back of each hole (see Figure 506.6.8.1). This ensures that the anchoring material flows out around each bar, fully encasing it. Do not coat one end of the bar with anchoring material and then insert the bar into the hole – the air pressure inside the hole will force the anchoring material back out of the hole, leaving a void around the bar. Dipping of the dowels into the anchoring material (cementitious or epoxy), ~~or grout~~ prior to insertion into the holes, is not permitted. The holes shall be filled from the back to the front with the anchoring material ~~epoxy or grout~~ prior to insertion of the dowel. ~~The holes shall be completely filled around the dowels so as to minimize vertical movement of the dowels and ensure that the dowels are permanently fastened to the existing concrete.~~ The anchoring material ~~epoxy or grout~~ shall~~is to~~ be put into the hole in sufficient quantity so that when the bar is inserted, the anchoring material completely fills the annular space around the dowel. Rotate the dowel bar one full revolution while inserting it into the hole. The holes shall be completely filled with the anchoring material around the dowels so as to minimize vertical movement of the dowels and ensure that the dowels are permanently fastened to the existing concrete. ~~The holes shall be filled from the back to the front with epoxy or grout prior to insertion of the dowel. Dipping of the dowels into epoxy or grout prior to insertion into the holes is not permitted.~~ A grout retention ring shall be used around all dowels, as shown in the WVDOH Concrete Repair Details. The end of the bar that extends into the repair area should have a bond breaker applied to it to prevent bonding with the patch material. This bond breaker may be applied at the manufacturer or field applied.

After installation, the vertical and horizontal skewness of the dowels shall be checked. If more than 3 dowels per joint are misaligned by more than 3/16-inch (5 mm) over a 9-

inch (230 mm) length, the repair boundary shall be re-sawed 1 foot (300 mm) back from the existing repair boundary, and dowels shall be re-installed. This work shall be done at the Contractor's expense.

The surface edges of all patches shall be tooled, formed and/or sawed, and cleaned to result in a properly dimensioned reservoir for sealant. All transverse and longitudinal joints at pavement repair locations shall be sealed in accordance with manufacturer's recommendations unless otherwise approved by the Engineer.

FIGURE 506.6.8.1



506.6.8.2-Type II Repairs: Full lane-width partial depth repairs at transverse joints and cracks and at longitudinal joints 12 feet or more in length shall be a minimum of 18 inches (450 mm) wide, with the vertical face of the repair being no less than 6 inches (150 mm) from the crack or the joint. Partial depth repairs shall be sawed a minimum depth of 2 inches (50 mm) around the perimeter of the patch area to provide a vertical face at the edges unless removal is to be performed with milling operations. Acceptable milling operations shall provide neat vertical faces and be approved by the Engineer. Concrete within the patching area shall be broken out with a pneumatic hammer not heavier than a 35-pound class or by other methods approved by the Engineer. Edge spalls greater than ¼ inch (6 mm) wide and 2 inches (50 mm) long and more than ½ inch (50 mm) deep below the pavement surface shall be repaired using an approved epoxy mortar. The patch boundary shall be extended by re-sawing the limits of the patch beyond the spalled area when spalls greater than 1 inch (25 mm) wide and 12 inches (300 mm) long and more than ½ inch (13 mm) deep below the pavement surface are created by the pavement removal operation.

The area of failure shall be removed by equipment that will not damage the adjacent sound pavement. The exposed faces of the concrete shall be free of loose particles, oil, dust, and other contaminants before placement of patch material. Immediately prior to placement of the concrete patch, all exposed concrete faces within the patched area shall be cleaned by sandblasting, then airblasting, then coated with an approved epoxy bonding compound per the manufacturer's recommendations. All residues shall be removed just prior to placement of the concrete bonding agent. The fresh concrete shall be placed in the

repair area while the epoxy bonding compound is still tacky. If the epoxy bonding compound is no longer tacky immediately prior to placement of the fresh concrete, then all surface contaminants shall be removed, and another coat of epoxy bonding compound shall be reapplied.

Any crack or joint within the limits of, or adjacent to, the partial depth repair shall be re-established by forming with an acceptable material in order to follow the crack or joint alignment. The method and material used to re-establish the crack or joint shall be approved by the Engineer. However, at joint repairs, sawcutting through the full-depth of the repair area may be used to fully re-establish the joint being repaired. Additionally, the Contractor shall saw and seal existing joints and cracks, involving partial depth repairs, in accordance with Section 510.

506.6.8.3-Type III Repairs: "Turned Down Edge" repairs at transverse joints and cracks shall extend no more than 12 inches (300 mm) into the slab from the edge of pavement whether at the outside or along an interior longitudinal joint. Concrete within the patching area shall be broken out with a pneumatic hammer not heavier than a 35-pound class or by other methods approved by the Engineer. The area of failure shall be removed by equipment that will not damage the adjacent sound pavement.

Number 4 tie bars, 10 inches (250 mm) in length, shall be inserted into the exposed vertical faces within the repair area. One bar shall be placed per one-foot (300 mm) of exposed face, or fraction thereof, on each side of the transverse crack or joint. The bar(s) shall be inserted at mid-depth of the slab, allowing for five inches (125 mm) of length to extend into the area to be repaired. The hole(s) for placement of the tie bar(s) into the exposed vertical face of the slab shall be slightly larger than the diameter of the bar and shall be drilled at an angle in order to allow for drill clearance. Hole diameters shall be 1⁄16 in. (1.6 mm) larger than the bar diameter when using epoxy material to anchor the bars, and hole diameters shall be 0.20 to 0.25 in. (5 to 6 mm) larger than the bar diameter using when cementitious grout to anchor the bars. Additionally, a minimum clearance of one inch shall be maintained around the hole for placement of concrete. The drilled holes shall be thoroughly cleaned with compressed air to remove all dust, dirt, loose material and moisture. An approved quick setting, non-shrinking cementitious grout or epoxy adhesive shall be used to anchor the bars in the holes. Before installing bars, place the anchoring material (cementitious grout or epoxy adhesive) in the back of each hole (see Figure 506.6.8.1). This ensures that the anchoring material flows out around each bar, fully encasing it. Do not coat one end of the bar with anchoring material and then insert the bar into the hole – the air pressure inside the hole will force the anchoring material back out of the hole, leaving a void around the bar. Dipping of the bars into the anchoring material (cementitious or epoxy),~~epoxy or grout~~ prior to insertion into the hole is not permitted. The holes shall be filled from the back to the front with epoxy or grout prior to insertion of the bar. The anchoring material shall be put into the hole in sufficient quantity so that when the bar is inserted, the anchoring material completely fills the annular space around the bar. Rotate the bar one full revolution while inserting it into the hole. The holes shall be completely filled with the anchoring material around the bars so as to minimize vertical movement of the bars and ensure that the bars are permanently fastened to the existing concrete. ~~The holes shall be filled from the back to the front with epoxy or grout prior to insertion of the bar. Dipping of the bars into epoxy or grout prior to insertion into the hole~~

~~is not permitted.~~ The bar should be bent prior to insertion into the grouted hole such that the exposed portion of the bar within the area being repaired shall be parallel with the pavement surface. No bars shall be placed in a manner that would interfere with free movement of the joint or crack being repaired and re-established.

The exposed faces of the concrete shall be free of loose particles, oil, dust, and other contaminants before placement of patch material. Immediately prior to placement of the concrete patch, all exposed concrete faces within the patched area shall be cleaned by sandblasting, then airblasting, then coated with an approved epoxy bonding compound per the manufacturer's recommendations. All residues shall be removed just prior to placement of the concrete bonding agent. The fresh concrete shall be placed in the repair area while the epoxy bonding compound is still tacky. If the epoxy bonding compound is no longer tacky immediately prior to placement of the fresh concrete, then all surface contaminants shall be removed, and another coat of epoxy bonding compound shall be reapplied.

Any crack or joint within the limits of, or adjacent to, the repair shall be re-established by forming with an acceptable material in order to follow the crack or joint alignment. However, at joint repairs, sawcutting through the full-depth of the repair area may be used to fully re-establish the joint being repaired. The method and material used to re-establish the crack or joint shall be approved by the Engineer. Additionally, the Contractor shall saw and seal existing joints and cracks, involving partial depth repairs, in accordance with Section 510.

506.7-RIDE ACCEPTANCE:

As soon as the concrete has hardened sufficiently, the pavement surface shall be tested with a 10 foot (3 m) straightedge. The straightedge shall be placed in successive positions parallel to the road centerline, matching existing wheel paths. Areas showing deviations (either high or low) of more than ¼ inch (6 mm) in 10 feet (3 m) shall be marked and corrected down with approved grinding equipment to an elevation where the surface deviations will not be more than ¼ inch in 10 feet (3 m). All joint sealing operations shall be performed after any grinding operations.

In the event that the deviation cannot be corrected to ¼ inch (6 mm) or less (either high or low) in 10 feet (3 m), the areas shall be removed and replaced at the discretion of the Engineer and at the Contractor's expense. All areas or sections so removed shall not be less than 6 feet (1.8 m) in length or less than full width of the traffic lane involved. Any remaining portion of the slab adjacent to the joints that is less than 6 feet (1.8 m) in length shall also be removed and replaced. Where concrete repairs are made that are to be overlayed, the smoothness criteria is waived for the concrete repair.

506.8-METHOD OF MEASUREMENT:

The quantity of concrete pavement repair to be paid for will be the number of square yards (meters) complete in place and accepted for all Type I and Type II repairs.

Additional concrete required to fill the excavated area up to the elevation of the bottom of the existing pavement for Type I repairs, as outlined in Section 506.6.2, shall be paid for by the cubic yard (meter).

For Type III repairs, each location complete in place and accepted will be paid for.

506.9-BASIS OF PAYMENT:

The quantity of concrete pavement repair, determined as provided above, will be paid for at the contract unit price and shall constitute full compensation for the furnishing, hauling, and placing of all materials, saw cutting pavement to the required depth, the removal and disposal of old concrete, preparing of sublayer, furnishing and installing steel dowels, furnishing and installing reinforcing steel as specified, furnishing, placing, finishing, and curing the concrete, cleaning and sealing joints, patch area protection, and for all other materials, labor, tools, equipment, and incidentals necessary to complete the item.

506.10-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
506001-003	Concrete Pavement Repair, Type I, "thickness"	Square Yard (Meter)
506001-004	Concrete Pavement Repair, Type II	Square Yard (Meter)
506001-005	Concrete Pavement Repair, Type III	Each
506003-*	Additional Concrete For Type I Repair~~Replace Existing Aggregate Base Course~~	Cubic Yard~~Ton (Megagram)~~

* Sequence number
"thickness" shall be in inches